US Army Corps of Engineers®
Savannah District

Glades Reservoir Draft Environmental Impact Statement

Chapter 1

Purpose and Need

October 2015

1 PURPOSE AND NEED

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1 PURPOSE AND NEED

1.1 Introduction

The United States Army Corps of Engineers (the Corps), Savannah District has prepared this draft Environmental Impact Statement (DEIS) to determine the direct, indirect, and cumulative impacts of the proposed Glades Reservoir water supply project on the human and natural environment. The Corps is currently reviewing an application for a Department of the Army permit pursuant to Section 404 of the Clean Water Act (CWA) for this proposed water supply reservoir to be located in Hall County, Georgia (Permit Application Number SAS-2007-00388). The Hall County Board of Commissioners, Hall County, Georgia (the Applicant) submitted this 404 permit application on June 10, 2011.Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States. The Corps determined that a DEIS is necessary in part to provide for full public disclosure. This DEIS will aid the Corps and other agencies in their respective decision-making processes.

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the Corps regulations for implementing NEPA (33 Code of Federal Regulations [CFR] 325, Appendix B and formulated to address the information requirements of Section 404(b)(1) Guidelines (40 CFR 230.10(a)(3)). The Corps, Savannah District, Regulatory Division is the lead federal agency responsible for preparing this DEIS.

The Corps also requested that the U.S. Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (EPD), with their statutory authorities related to the type of the project proposed, participate in the NEPA process as cooperating agencies (40 CFR 1501.6, 1508.5). Formal cooperating agency agreements have been executed between the Corps and EPA and EPD. The U.S. Fish and Wildlife Service (USFWS) declined to be a cooperating agency due to funding limitations but will execute its review responsibilities of this DEIS with respect to the Fish and Wildlife Coordination Act at a later date. The Corps will initiate required consultation with the USFWS at an appropriate time during the development process of this DEIS.

This chapter summarizes the project background and presents the Applicant's stated purpose and need for the Proposed Project, and the Corps' basic determined purpose and need.

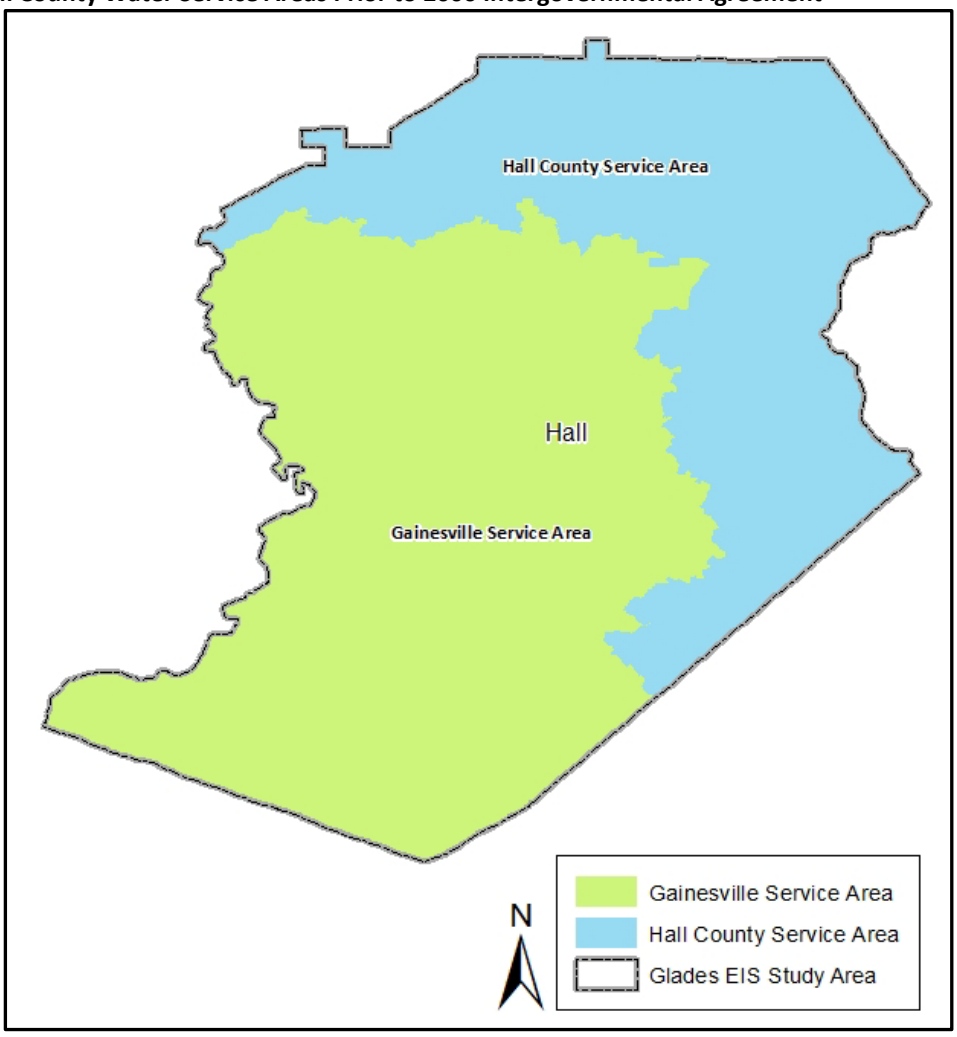
1.1.1 Project Background

The Applicant's preferred alternative (Proposed Project) has evolved over time from a smaller project serving only northern and eastern Hall County (Hall County's service area pre-2006) to a larger project serving all of Hall County. The development of the project has been complicated by Georgia's long-term conflict over water rights in Lake Sidney Lanier (Lake Lanier) with the states of Alabama and Florida.

Prior to filing the 404 permit application in 2011, the Applicant had filed a Section 404 permit application with the Corps in February of 2007 for a proposed 6.4 million gallon per day (mgd) Glades Reservoir. This proposed reservoir was designed to have limited drawdown and was proposed to serve

Hall County's water service area at the time (northern and eastern Hall County, **Figure 1.1**) with no pumping from the Chattahoochee River.

Figure 1.1 Hall County Water Service Areas Prior to 2006 Intergovernmental Agreement



In July 2009, the District Court held that water supply was not an originally authorized purpose of Lake Lanier under the legislation that created Lake Lanier, and that the Corps required congressional authorization to operate Buford Dam and Lake Lanier to meet the current level of water supply for the metro Atlanta region (*Tri-State Water Rights Litigation*, 639 F. Supp. 2d 1308, 1347). This ruling, often referred to as "the Magnuson ruling", put the future availability of water from Lake Lanier in doubt. The ruling established a deadline of July 2012 for Georgia, Alabama, and Florida to come to a water-sharing agreement, or the withdrawals from Lake Lanier would be reduced to mid-1970s levels.

As a result, Hall County subsequently withdrew the 2007 application and submitted an application for a proposed 72.5 mgd Glades Reservoir project in June 2011 (hereinafter referred to as the "original Proposed Project"). The Proposed Project from the 2011 404 permit application is presented in **Figure 1.2**. This Proposed Project included a new 850-acre reservoir, pipelines, and pump stations for pumping from the Chattahoochee River to the proposed Glades Reservoir and to the existing Cedar Creek Reservoir. Water pumped from the Chattahoochee River was to be stored in the proposed Glades Reservoir. When needed, water was to be pumped from the Glades Reservoir to Cedar Creek Reservoir for an eventual withdrawal from the Cedar Creek Reservoir for treatment at a planned water treatment facility near Cedar Creek Reservoir prior to distribution.

In June 2011, the Eleventh Circuit Court of Appeals reversed the District Court's decision in the *Tri-State Water Rights Litigation*, finding that water supply for the metro Atlanta area was an authorized purpose of Lake Lanier. The Eleventh Circuit Court instructed the lower court to direct the Corps to complete its analysis of its water supply authority (644 F.3d 1160, 1250). In June 2012, the Corps issued the legal opinion outlining its water supply authority, which stated that the Corps has legal authority to operate Buford Dam and Lake Lanier to accommodate Georgia's water supply as requested by the Governor of Georgia in 2000.

The Corps of Engineers' Legal Opinion (June 25, 2012)

On June 25, 2012, the Corps' Office of the Chief Counsel issued a legal opinion and affirmed the Corps' legal authority to operate Lake Lanier to accommodate Georgia's 2000 request for meeting its water supply needs. In this legal opinion, the Corps did not commit to accommodate all of Georgia's requested need for 2030. The Corps has resumed its update of the Water Control Manual (WCM) for the ACF Basin, and its associated NEPA analysis, with an analysis to accommodate some level of water withdrawal request for Lake Lanier and downstream Atlanta.

Following the Corps' legal opinion, the Applicant requested a modification of their original Proposed Project in August 2012. A full description of the Applicant's current Proposed Project is located in Section 1.1.2. **Figure 1.3** presents a summary timeline of key events that affected the evolution of the Proposed Project.

The Corps Mobile District is also currently preparing a DEIS for the update of its Apalachicola-Chattahoochee-Flint (ACF) Basin Water Control Manual (WCM). The DEIS will evaluate effects from the implementation of potentially significant changes in the operations of the facilities in the ACF Basin. The DEIS will assess potential operation modifications and their impacts to accommodate Georgia's 2000 request for meeting its water supply needs. In January 2013, the State of Georgia updated the "State of Georgia's Water Supply Request" in a letter to the Assistant Secretary of the Army for Civil Works. Within this letter, the state requested 297 mgd in total withdrawals from Lake Lanier and 408 mgd in total withdrawals from the Chattahoochee River downstream of Buford Dam to meet 2040 water needs in the state. Although there is a determination of authority, in the legal opinion issued in June 2012, the

Corps did not commit to accommodate all of Georgia's requested needs; therefore, the quantity to be allocated for water supply from Lake Lanier will not be determined or made available until the Corps Mobile District completes its DEIS and WCM update process.

On October 1, 2013, Florida filed a lawsuit against Georgia in the U.S. Supreme Court (State of Florida v. State of Georgia) seeking a stop to Georgia's "unmitigated and unsustainable upstream consumption of water from the Chattahoochee and Flint River Basins." (Scott 2013) This legal action contributes to the likelihood that resolving Lake Lanier's water supply allocation will be a lengthy process with continuing controversy between Georgia and the downstream states of Alabama and Florida.

Potential Lake Lanier operational modifications that might result from the WCM update could affect information presented in this DEIS. Coordination between the DEIS teams has occurred to ensure that, to the extent practical, consistent basin hydrology, infrastructure layouts, and operational scenarios have been assessed in each DEIS.

1.1.2 Applicant's Proposed Project

Hall County informed the Corps in a letter dated August 10, 2012, (and a subsequent clarification letter dated August 23, 2012, both of which are found in **Appendix A**) that its new Proposed Project with the proposed Glades Reservoir would no longer include use of the Cedar Creek Reservoir and a pipeline connection to it. This revision to Hall County's original Proposed Project was prompted by two legal decisions: 1) the U.S. Supreme Court's denial of certiorari to Alabama and Florida's appeal of the Eleventh Circuit Court of Appeals decision in June, 2011; and 2) the Corps' legal opinion (June 2012) stating its legal authority to accommodate Georgia's request for meeting its water supply needs.

In the Applicant's revised Proposed Project, water from the Chattahoochee River would be pumped to the proposed Glades Reservoir only when the minimum instream flow can be maintained in the river below the pump station and there is available space in the reservoir. This condition will be maintained at all stages, including reservoir filling.

When the current allocated supply from Lake Lanier (18 mgd) is insufficient to meet Hall County's needs, water would be released from the Glades Reservoir and will flow via Flat Creek and the Chattahoochee River into Lake Lanier. In another word, raw water from the reservoir would "pass-through" Lake Lanier prior to being withdrawn for treatment. An amount of water equal to what is released from the reservoir would be withdrawn from Lake Lanier through an existing City of Gainesville water intake and made available for Hall County's use after treatment, thus eliminating the pumps and pipeline to the Cedar Creek Reservoir. Project elements of Hall County's updated Proposed Project, including locations of the proposed reservoir, pump station, pipeline, and potential intakes are shown in **Figure 1.4**. The Applicant's Proposed Project does not directly provide raw water to a treatment plant.

Figure 1.2 Applicant's Original Proposed Project (June 2011)

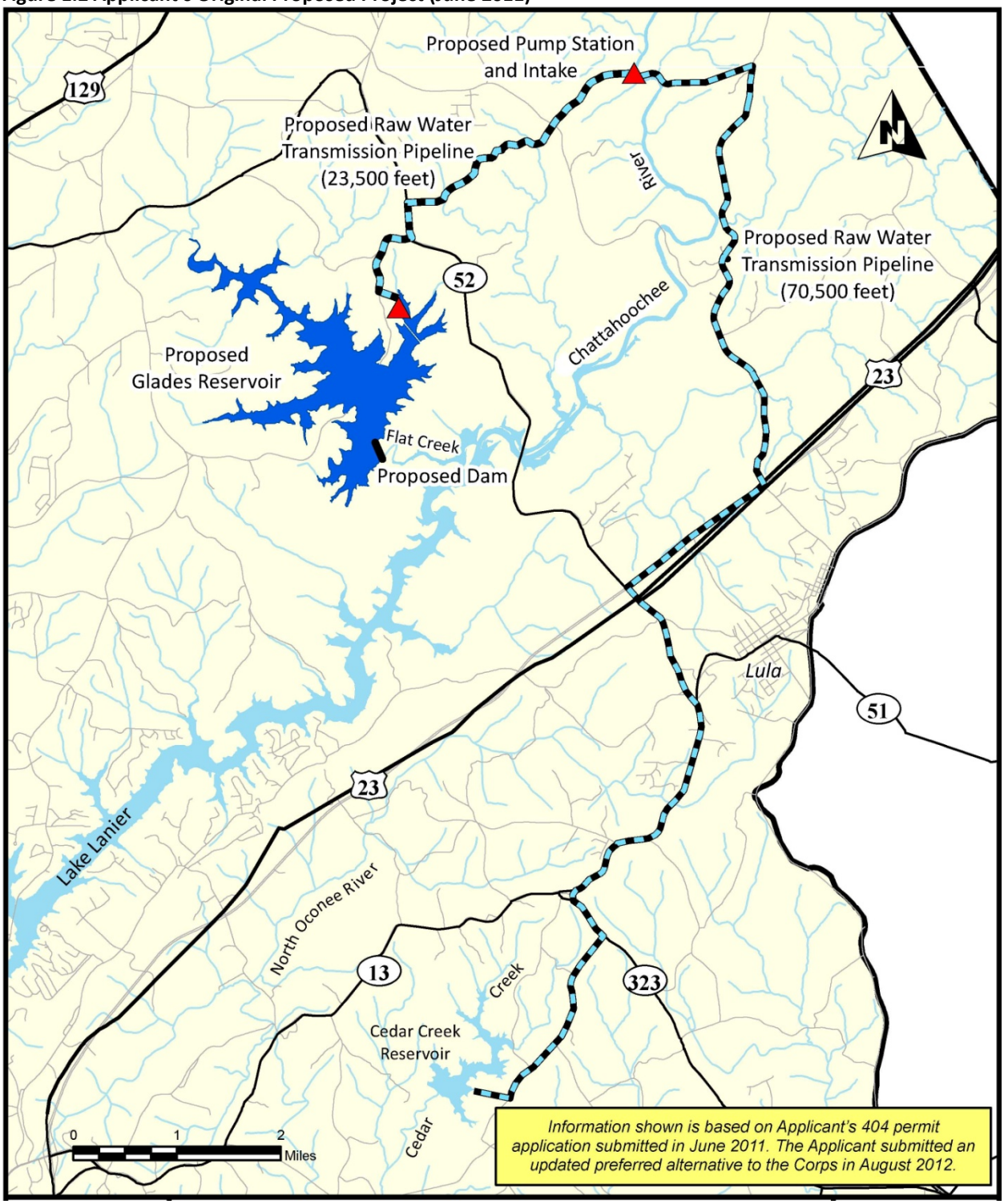


Figure 1.3 History of the Proposed Glades Reservoir Project and the Tri-State Water Dispute

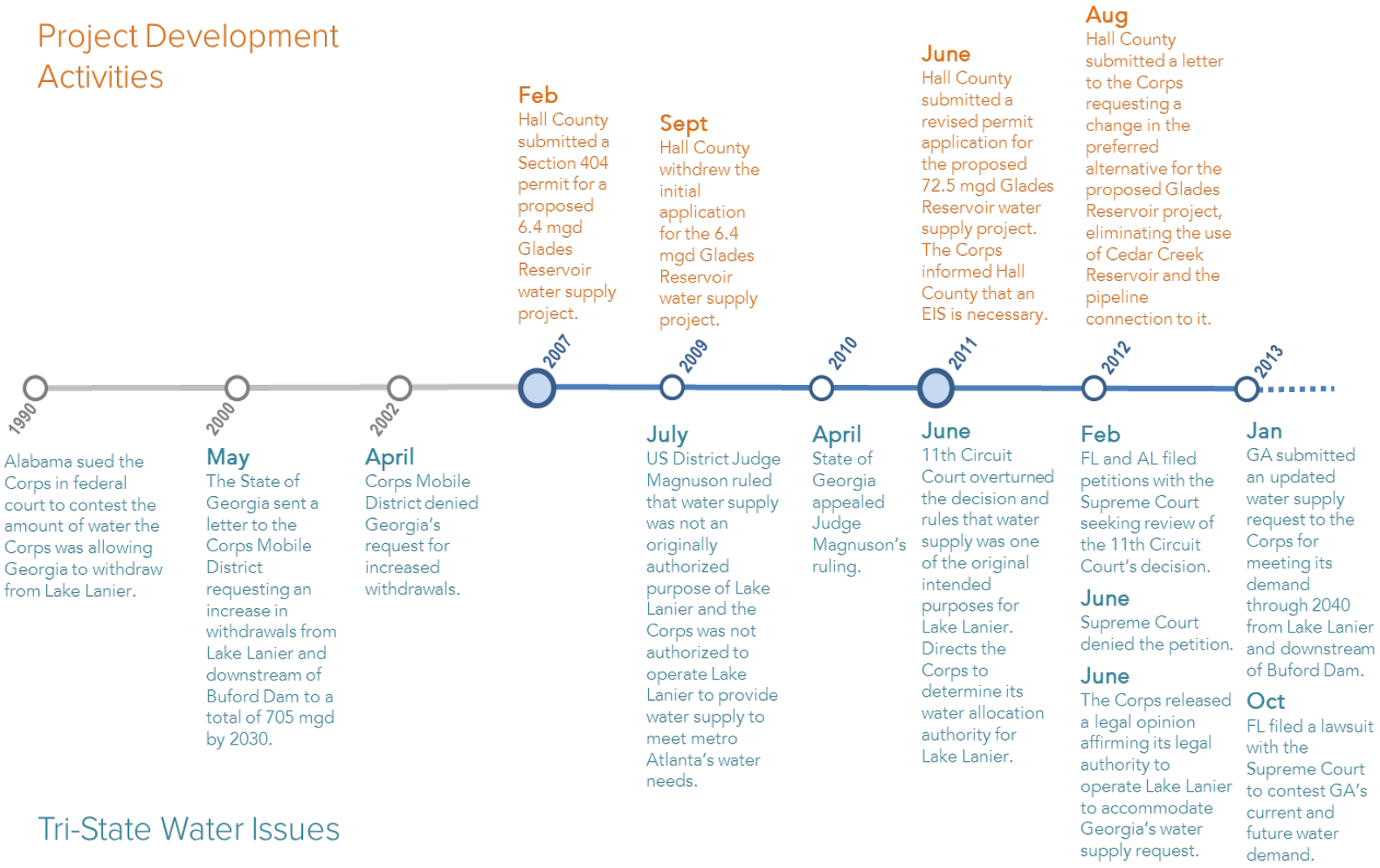
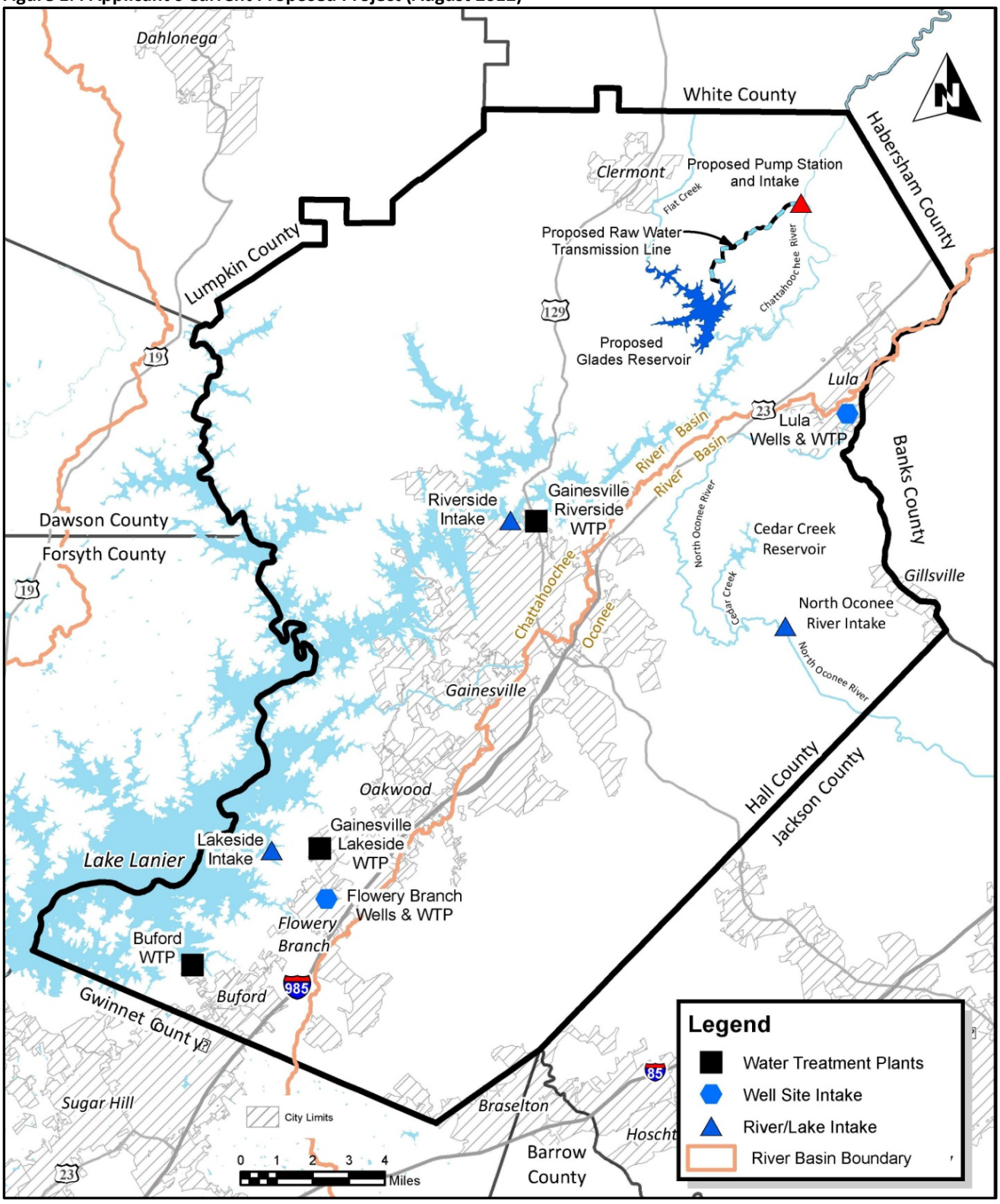


Figure 1.4 Applicant's Current Proposed Project (August 2012)



1.2 Applicant's Stated Purpose and Need

The Applicant has provided several documents with information related to their position on purpose and need for the proposed Glades Reservoir project. These documents have been reviewed in the Purpose and Need Technical Memorandum (**Appendix B**).

1.2.1 Applicant's Stated Purpose

In the 404 permit application (2011) and other supporting documents, the Applicant has stated that the project purpose is, "to provide a reliable source of public water supply capable of satisfying the projected unmet water demand in the Service Area of Hall County during drought conditions for the projected population growth through the year 2060" (Alternatives Analysis, 404 permit application). The Applicant defined the project service area as all of Hall County, including jurisdictions and areas currently served by other municipal or private entities.

1.2.2 Applicant's Stated Need

The Applicant has identified the following three aspects of need for the Proposed Project:

Fifty-year planning horizon. To ensure its citizens (residents and businesses in all of Hall County) continue to have a reliable source of water supply, the Applicant has concluded that it has an obligation to use a 50-year planning horizon (Year 2060 Water Needs Certification, 404 permit application). The Applicant has stated that this obligation is consistent with state law authorizing counties to provide municipal water supplies, and the 50-year planning horizon is in accordance with *Georgia Comprehensive State-wide Water Management Plan 2008* (Section 10 Water Supply Management Practices).

Reliability of future water supplies. Hall County indicates a need for a water supply source that will be reliable during times of drought and that a reservoir is a necessary component of water supply sources (Alternatives Analysis, 404 permit application).

Need to secure adequate water supply now. Hall County specifies that it must move forward now to secure an adequate water supply using the best available information; its water supply planning cannot be delayed until Lake Lanier water allocation and contracting issues are resolved (Year 2060 Water Needs Certification, 404 permit application).

Based on these aspects, the Applicant has projected their water need to be 77.3 mgd based on a projected 2060 population of 644,383 and 120 gallons per capita water demand per day (gpcd) in their April 18, 2013, revised population projection submittal, which is included as an attachment to the Populations Projection Technical Memorandum included in **Appendix C**.

1.3 Hall County Background

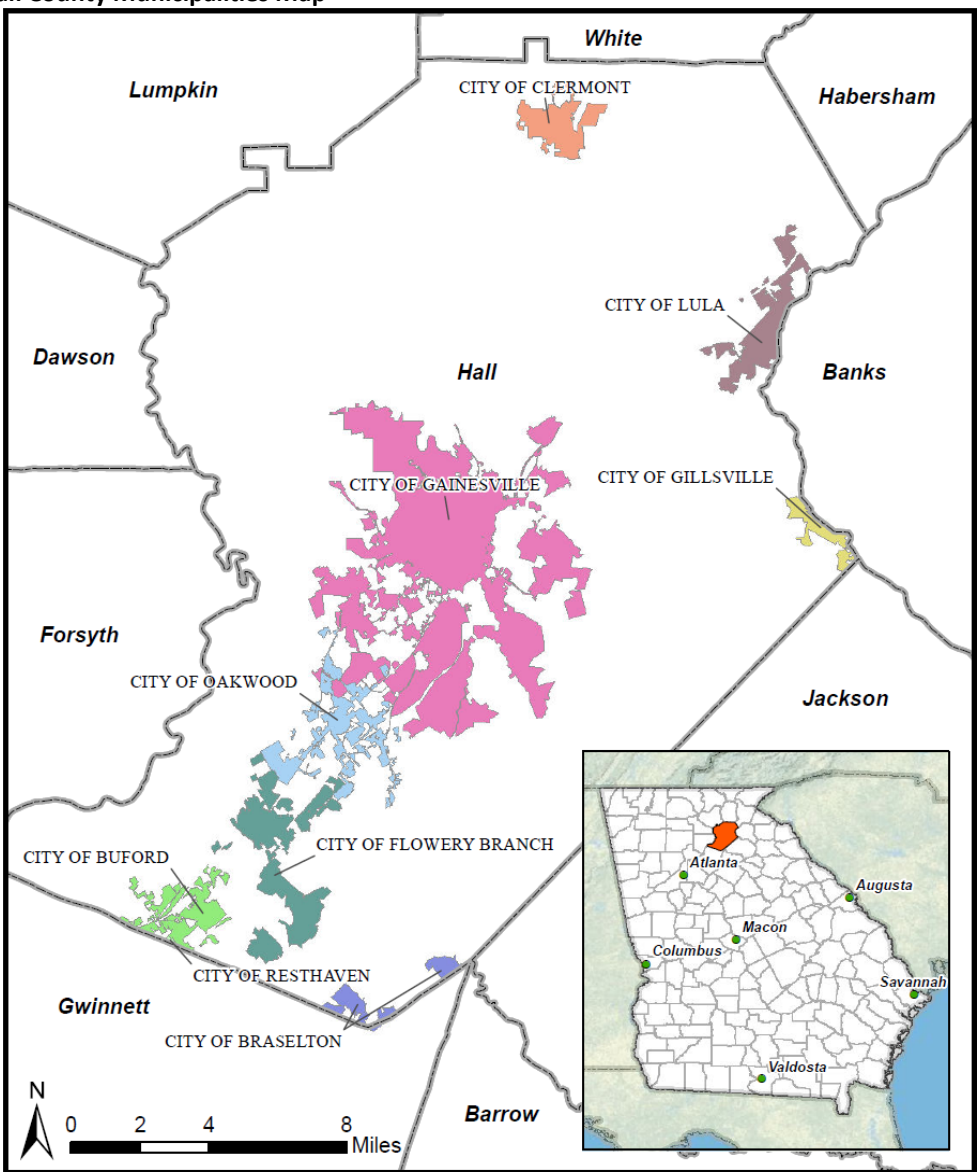
1.3.1 Background

Hall County is located 35 miles northeast of Atlanta, Georgia. The City of Gainesville (Gainesville) serves as the county seat and is the largest city in Hall County. In addition to Gainesville, there are several incorporated cities and towns located either partially or entirely within Hall County's borders, including Clermont, Lula, Gillsville, Oakwood, Flowery Branch, Buford, Resthaven, and Braselton. Hall County has intergovernmental coordination agreements with these cities to provide various services, including regional coordination.

Figure 1.5 shows the incorporated limits for these municipalities within Hall County.

The County was founded in 1818 as the trading center of Northeast Georgia. Traditionally, development in Hall County centered on Gainesville and other cities; however that trend has been replaced by rapidly suburbanized development across the county. In recent years, development has occurred in both north and east Hall County. Commercial development continues to be focused in municipalities, while the majority of industrial development is located in unincorporated Hall County. Infrastructure such as water, sewer, and transportation facilities are being planned to continue development patterns around the employment centers in the county.

Figure 1.5 Hall County Municipalities Map



Because of its proximity to Atlanta and Lake Lanier, Hall County has experienced growth during the last two decades. Gainesville-Hall County became a Metropolitan Statistical Area (MSA) in 2004, and the area was among the top 50 fastest growing metropolitan areas in the U.S. during the period of 1990 to 2010 (U.S. Census). The county population nearly doubled from 95,428 in 1990 to 179,684 in 2010, because of expansion of the metropolitan Atlanta area and the growth of local industries. Hall County, especially Gainesville, is known as the “poultry capital of the world” because of the presence of a large number of poultry processing plants; employment in poultry processing makes up about 10 percent of the total employment in Hall County (http://www.gainesville.org/history). In addition, Hall County is Northeast Georgia's center for banking, industry, health care, outdoor recreation, and culture.

1.3.2 Hall County's Statutory Authorities and Responsibilities

Hall County government provides services to the entire county through the Board of Commissioners and various appointed and elected officials and boards. The county government administers and enforces state laws, collects taxes, assesses property, records public documents, conducts elections, and issues licenses. It provides parks, libraries, civil defense, welfare and medical services and serves the unincorporated areas by providing and maintaining roads and bridges, police protection, building inspections, planning and zoning.

The county's Planning Department develops long-range plans, such as the Hall County Comprehensive Plan, designed to direct and manage land use based on a wide range of diverse community goals. The Public Works Department coordinates the work of water and sewer services (to parts of Hall County), road and bridge maintenance, solids waste and landfill services, and engineering services supporting these services. The Gainesville-Hall Metropolitan Planning Organization is the intergovernmental transportation planning agency for Hall County. Other providers of water and sewer services are discussed in Section 1.5.

Hall County and Gainesville collaborate on some public functions – examples include: Comprehensive Planning and water and sewer services. Hall County and Gainesville have an intergovernmental agreement (established in 2006) which delegates the authority to provide potable water for Hall County to Gainesville Department of Public Works (GPUD). Hall County has initiated this application for additional water supply, as they feel the County's future growth is restricted without additional water supplies for the region. The City of Gainesville has issued a proclamation in support of the Application, as they will ultimately be responsible for treatment and distribution of the raw water.

1.3.3 Service Area for the Proposed Project

The Applicant stated that the service area for this project is all of Hall County (Alternative Analysis, 404 permit application). Based on the overall project purpose stated in Section 1.3.2, the Corps considers Hall County as a whole to be the service area for the Proposed Project. It is assumed that the Applicant's intent is to secure sufficient raw water supplies for the County as a whole, and that the authorized water supplies will be provided to GPUD to provide finished water to all of the County.

1.4 Current Water Services

This section provides an overview of current water services in Hall County and the 2006 intergovernmental service agreement between Hall County and Gainesville that resulted in Gainesville being the primary municipal water provider in Hall County.

1.4.1 Overview of Water Systems in Hall County

Currently, the municipal water systems of the cities of Gainesville, Flowery Branch, and Lula provide drinking water services in Hall County; the county does not own any water treatment plants (WTP), nor

does it provide any finished (drinking) water service. Gainesville relies mainly on a surface water supply source (Lake Lanier) and both Flowery Branch and Lula use groundwater as their primary water supply source. A description of each water system service area is included below:

- The City of Gainesville is the largest water service provider in Hall County. In Fiscal Year 2012, the city provided water to 46,732 customer accounts (or an estimated population of 126,948), located both inside the Gainesville city limits and in unincorporated Hall County (through an intergovernmental lease and management agreement with Hall County in 2006, discussed further in Section 1.5.2.). Gainesville's water service area covers approximately 400 square miles in Hall County.
- The City of Flowery Branch currently provides some water service within its city limits. Flowery Branch's water service area currently covers nearly 6 square miles in southwest Hall County, serving 974 customer accounts (or an estimated population of 2,792) in 2012.
- The City of Lula provides some water service within its city limits. Lula's water service area covers over 3.5 square miles in northeast Hall County, serving 1,064 customer accounts (or an estimated population of 2,933) in 2012.

1.4.2 2006 Intergovernmental Lease and Management Agreement

Prior to 2006, Hall County owned and operated a water distribution system (including the Cedar Creek Reservoir and its intake on the North Oconee River), and Gainesville owned and operated a separate water treatment and distribution system (shown on **Figure 1.1**).

Through the *Hall County-Gainesville Intergovernmental Lease and Management Agreement Concerning the Hall County Water System* signed in January 2006 (2006 Intergovernmental Agreement, **Appendix G**), Gainesville currently operates and maintains Hall County's water distribution system. Under this agreement, Gainesville and Hall County agreed to operate the two water systems as one, with Hall County permanently providing a long-term lease of the Hall County water distribution system to Gainesville. Gainesville is to gain ownership of Hall County's distribution system at the end of the 25-year lease (*i.e.*, 2031).

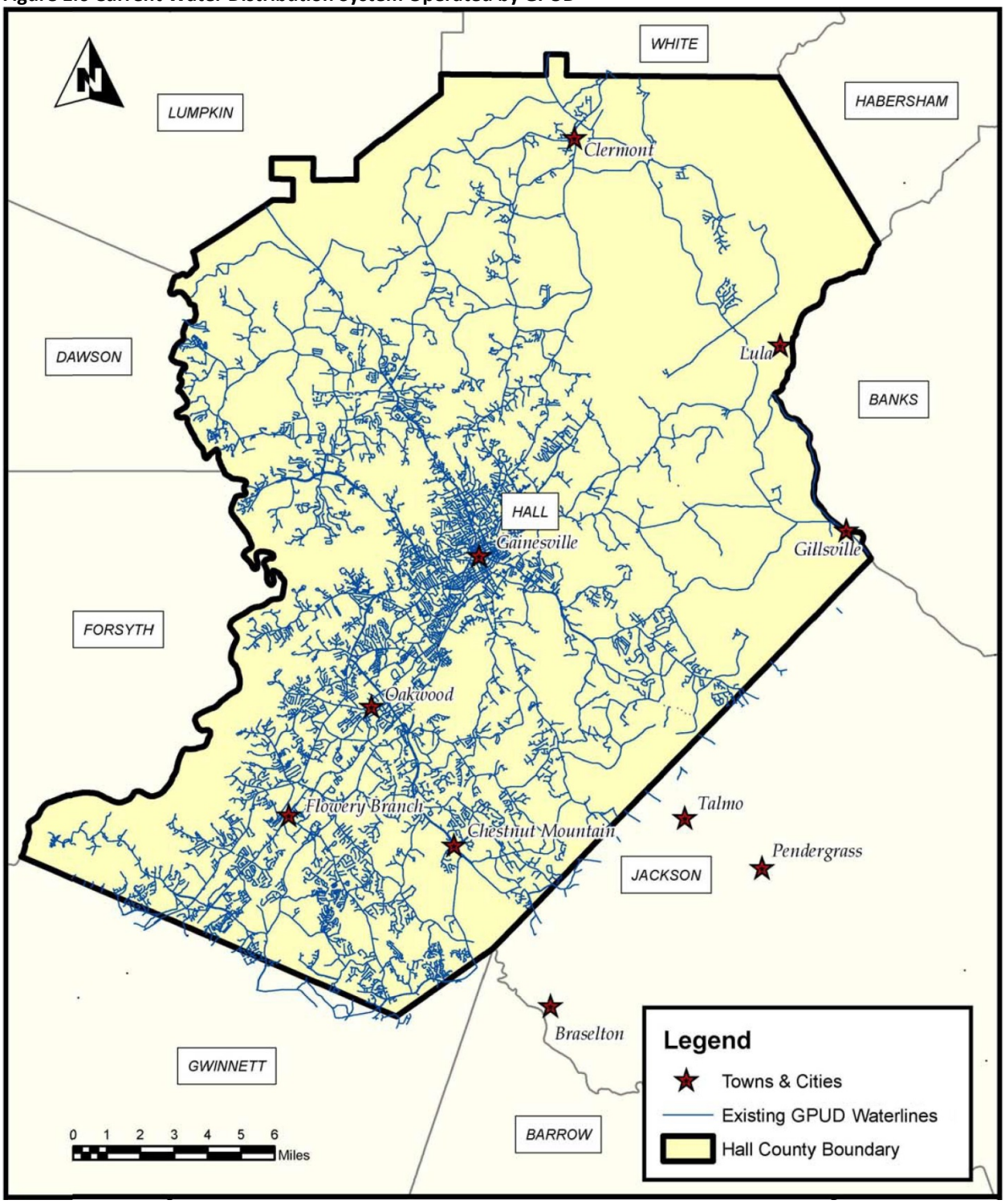
This arrangement was initiated to facilitate state permitting for efficient operations and to provide consistent service across the water systems. As shown **Figure 1.6**, the water distribution system now serves city and county customers, and extends throughout most of Hall County. However, only limited public water service is currently provided in northern and eastern Hall County.

1.4.2.1 Cedar Creek Reservoir/North Oconee River Intake Withdrawal Permits

Despite the 2006 Intergovernmental Agreement, the ownership of the water withdrawal permits for the Cedar Creek Reservoir and its source water on the North Oconee River have not been resolved at the time of this DEIS writing.

Hall County maintains the position that it continues to own the surface water withdrawal permits for the Cedar Creek Reservoir and its North Oconee River intake. However, Gainesville currently maintains the Cedar Creek Reservoir and its raw water intake and pump station on the North Oconee River according to the 2006 Intergovernmental Agreement and will eventually gain ownership of the reservoir. According to Georgia EPD, the renewal applications for the water withdrawal permits for the Cedar Creek Reservoir and North Oconee River is currently on hold. The Corps has been notified by Hall County that the two parties are working to resolve the differences of the ownership for the withdrawal permits. Hall County and Gainesville reached an intergovernmental agreement for sewer service for the Georgia 365 corridor in September 2013 and Gainesville has discussed a resolution calling for support and co-operation with Hall County on developing the proposed Glades Reservoir. The most recent conversations (in 2015) with both entities indicate that the county and the city have agreed to postpone the renewal of the Cedar Creek Reservoir/North Oconee River withdrawal permits until the impacts of the potential changes in Lake Lanier water allocation quantity and the ACF Basin WCM Update are better understood.

Figure 1.6 Current Water Distribution System Operated by GPUD



1.4.3 Water Supply Sources

1.4.3.1 Surface Water

Lake Lanier historically has been Hall County's primary water supply source, with treatment and distribution provided by Gainesville's two WTPs located near Lake Lanier. Annual average daily withdrawal from Lake Lanier was approximately 18 mgd for the twelve year period between 2000 and 2012. In addition to Lake Lanier, Cedar Creek Reservoir was completed in 2005 to provide additional future surface water supply in the portion of Hall County located in the North Oconee River Basin. The Cedar Creek Reservoir is a pumped-storage reservoir with an accepted calculated yield of 7.5 mgd (annual average daily basis) based at the time that EPD issued a withdrawal permit for the facility. Hall County is permitted to pump a maximum of 20 mgd daily from the North Oconee River for storage in the Cedar Creek Reservoir. An intake structure has been designed and constructed at the reservoir for future pump installation. A future water treatment facility to be located adjacent to the reservoir also has been designed, but has not been constructed.

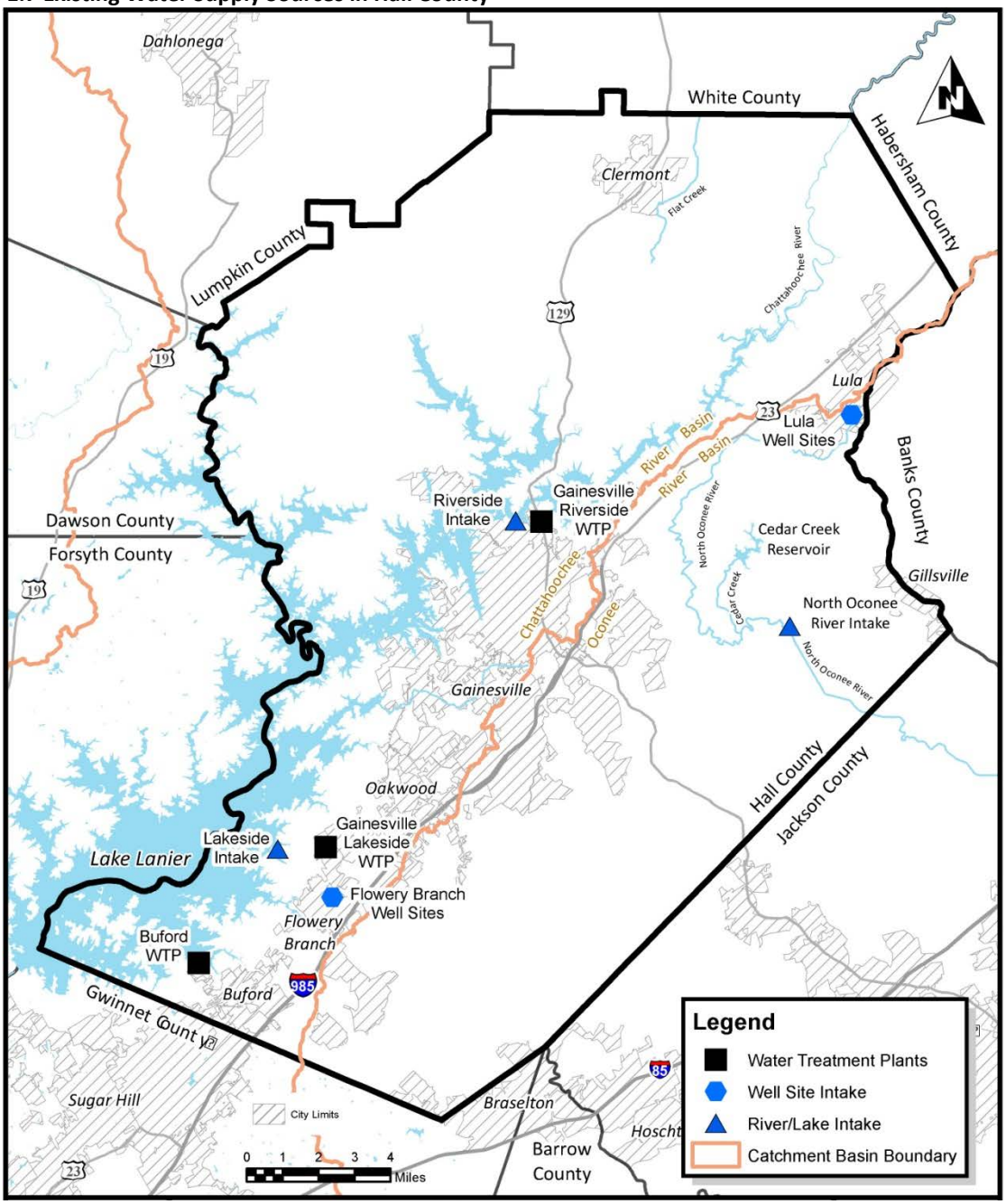
Table 1.1 provides a summary of existing permitted surface water withdrawals. **Figure 1.7** shows the surface water supply sources, as well as the existing water production facilities within Hall County.

Table 1.1 Surface Water Withdrawal Permits in Hall County (April 2012)

River Basin	Permit Holder	Permit Number	Source Water	Permit Limit Max Day (mgd)	Permit Limit Monthly Average (mgd)
Chattahoochee	Buford, City of	069-1290-04	Lake Sidney Lanier	2.5	2.0
Chattahoochee	Gainesville, City of	069-1290-05	Lake Sidney Lanier	35.0	30.0
Chattahoochee	LLI Management Company, LLC	069-1205-01	Lake Sidney Lanier	0.6	0.6
Chattahoochee	LLI Management Company, LLC (Pine Isle)	069-1205-02	Lake Sidney Lanier	0.6	0.6
Oconee	Hall County Government	069-0301-04	North Oconee River	20.0	20.0
Oconee	Hall County Government	069-0301-05	Cedar Creek Reservoir	2.5	2.0
Oconee	Milliken & Co. – New Holland Plant	069-0301-02	Spring Source	0.36	0.32

Source: GA EPD 2013

Figure 1.7 Existing Water Supply Sources in Hall County



1.4.3.2 Groundwater

Historically, groundwater use has been low compared to surface water use in Hall County. Groundwater is the primary water supply source for the City of Lula and for the City of Flowery Branch (**Figure 1.7**). Additionally, groundwater serves some private uses such as industries, single-family residences, golf course irrigation, and limited agricultural activities in Hall County. Permitted groundwater withdrawals (non-farm) total 2.7 mgd on an annual average basis, as shown in **Table 1.2**.

Table 1.2 Non-Farm Groundwater Withdrawal Permits in Hall County (October 2011)

Aquifer	Permit Number	Permit Holder	Permit Limit Yearly/ Monthly Average (mgd)
Crystalline Rock	069-0002	Fieldale Farms Corporation	1.20
Crystalline Rock	069-0003	City of Flowery Branch	0.70
Crystalline Rock	069-0004	Pilgrim's Pride Corporation of Delaware	0.30
Crystalline Rock	069-0005	City of Lula	0.50

Source: (GA EPD 2013)

1.4.4 Water Treatment Facilities

Four finished water treatment facilities are currently in operation in the county. A fifth plant, to be operated by Hall County, has also been proposed and designed. Each facility is shown on **Figure 1.7** and detailed below.

1.4.4.1 City of Gainesville Riverside Drive Water Treatment Plant

The Riverside Drive WTP was constructed in the early 1950s and has a current treatment capacity of 25 mgd. The plant draws water from Lake Lanier prior to treatment and distribution to its customers. Various expansions and upgrades to the treatment plant have been completed since the plant's original construction to bring it to its present capacity. No further expansions to this treatment plant are planned.

1.4.4.2 City of Gainesville Lakeside Drive Water Treatment Plant

The Lakeside Drive WTP opened in 2002 with a capacity of 10 mgd. Raw water is pumped from the intake station located at Lake Lanier through two 42-inch diameter lines to the treatment plant. Future expansions are planned to bring the total capacity to 46 mgd. Expansions will be phased to meet the anticipated customer demand. According to Gainesville, there is space on the existing site to expand the plant to 100 mgd.

1.4.4.3 City of Flowery Branch Water Treatment Plant

The City of Flowery Branch currently operates a WTP. Raw water is sourced from the Crystalline Rock aquifer with a permit limit of 0.70 mgd (**Table 1.2**). According to the city's 2010 Community Assessment Addendum, the existing plant will likely not meet future needs, so the city anticipates purchasing water from an adjacent water provider.

1.4.4.4 City of Lula Water Treatment Plant

The City of Lula currently operates a water treatment plant. Groundwater is withdrawn from the Crystalline Rock aquifer with a permit limit of 0.50 mgd (**Table 1.2**).

1.4.4.5 Hall County Cedar Creek Water Treatment Plant (planned)

The Cedar Creek WTP is a proposed future facility and its planned (maximum day) capacity will be 12 mgd. The plant will obtain its raw water from the North Oconee River stored in the Cedar Creek Reservoir.

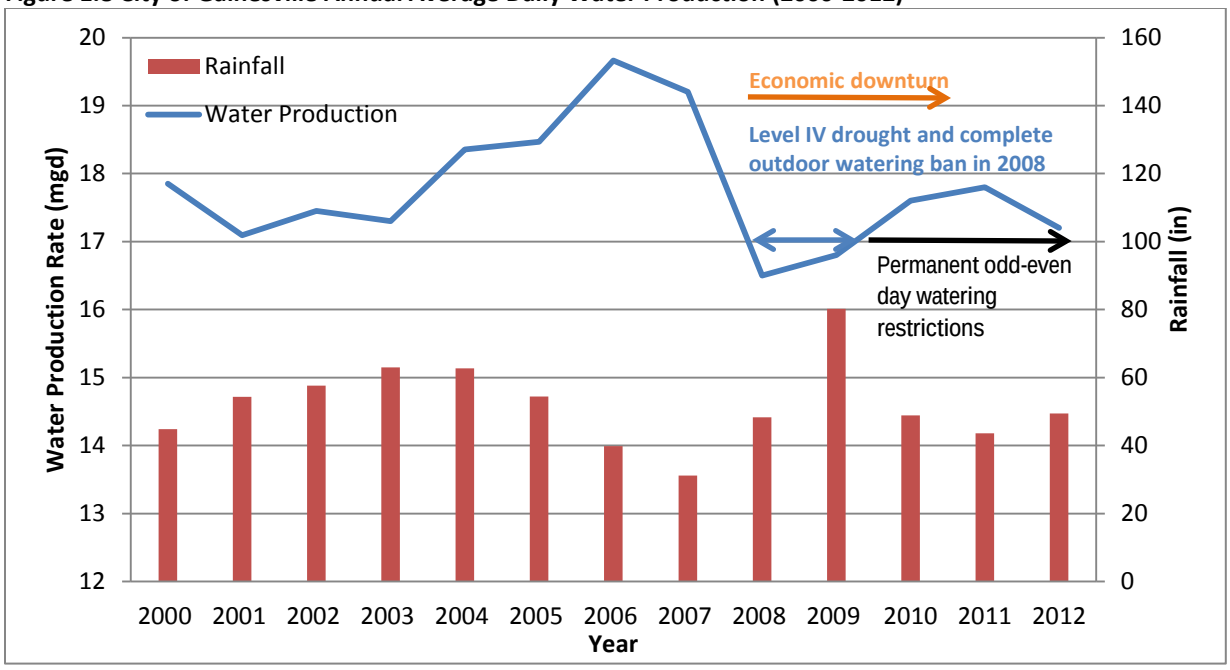
1.4.5 Current Water Use

Because the City of Gainesville is the largest water provider for Hall County, the water use and conservation assessment focuses on data provided by Gainesville. Given that these data are the best available, trends identified by these data are used to extrapolate water use across the county. A detailed water demand analysis is presented in the Supply, Demand, and Conservation Technical Memorandum, included as **Appendix D**. This section summarizes major municipal surface water and groundwater withdrawals.

1.4.5.1 Surface Water Use

Actual water withdrawal and production rates vary daily based on customer usage, weather conditions, and water use restrictions. **Figure 1.8** shows the combined annual average daily production rate from Gainesville's two WTPs and annual rainfall for the period of 2000 – 2012. With the increase in population, businesses, and industries, water use increased steadily in the early 2000s and peaked in 2006. Water use decreased significantly in 2008-2009 due to severe drought and the outdoor watering ban imposed during 2008. Water use did not return to the pre-drought level for several reasons. After the 2008-2009 droughts, the State of Georgia implemented permanent odd-even day watering restrictions and in 2009, the Metropolitan North Georgia Water Planning District adopted additional water conservation requirements. In addition, the economic slowdown began to affect population and businesses.

Figure 1.8 City of Gainesville Annual Average Daily Water Production (2000-2012)



Sources:
Water production data - Gainesville Department of Public Utilities
Rainfall data - NOAA National Climatic Data Center, Asheville NC; Site 093621, Gainesville, Georgia

1.4.5.2 Groundwater Use

Historically, groundwater use has been low compared to surface water use in Hall County. Groundwater provides the primary public water supply source for the cities of Lula and Flowery Branch. Groundwater is also used as a water supply source for several private industries, single-family residences, small community water systems, golf course irrigation, and limited agricultural activities in Hall County.

Table 1.3 provides a summary of average groundwater withdrawals by major public and industrial users in Hall County for the years 2000-2012. The reported annual average withdrawals by the major public and industrial users ranged from 0.59 to 1.11 mgd in the 12-year period of 2000-2012, with the lowest withdrawals reported during the 2008-2009 drought period.

Self-service single family residences are not required to get a State withdrawal permit or report their groundwater use. For the purpose of this EIS, the self-service single family residences were estimated by subtracting the total number of single family accounts reported for 2010 by the Gainesville Public Utility Department (GPUD) from the total single family dwelling units reported in the 2010 Census for Hall County. Using the above assumptions, it is assumed that 13,423 households currently use groundwater that is self-supplied, and assuming an average use of 180 gallons per day per household (62 gpcd based on an average household size of 2.91 persons per household), this equates to approximately 2.4 mgd of self-supplied groundwater use in Hall County.

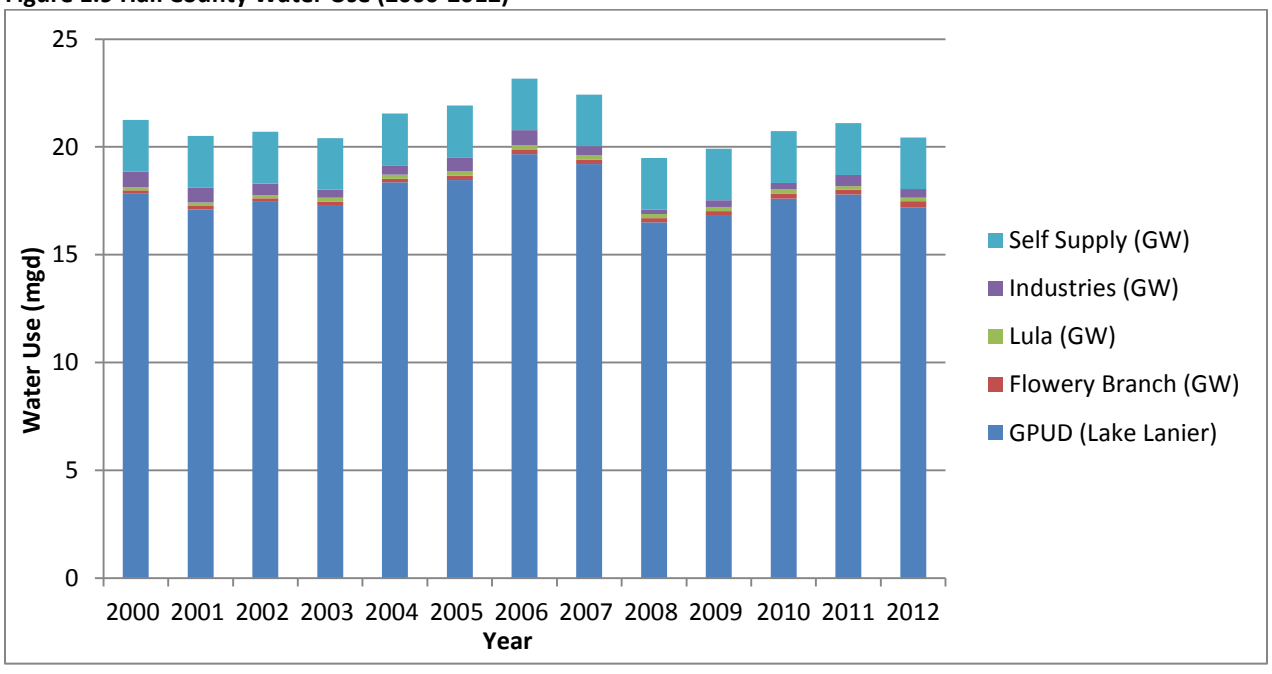
Table 1.3 Average Groundwater Withdrawal by Major Public and Industrial Users in Hall County (2000-2009) [1]

Year	City of Flowery Branch (mgd)	City of Lula (mgd)	Industries [2] (mgd)	Total [3] (mgd)
2000[1]	0.14	0.15	0.71	1.00
2001[1]	0.17	0.16	0.69	1.02
2002[1]	0.16	0.16	0.53	0.85
2003[1]	0.17	0.17	0.37	0.71
2004[1]	0.17	0.18	0.44	0.79
2005[1]	0.20	0.20	0.65	1.05
2006[1]	0.20	0.22	0.69	1.11
2007[1]	0.21	0.20	0.42	0.83
2008[1]	0.20	0.19	0.20	0.59
2009[1]	0.22	0.19	0.31	0.72
2010[4]	0.24	0.19	0.30	0.73
2011[4]	0.21	0.17	0.52	0.90
2012[4]	0.28	0.16	0.40	0.84

[1] Source: Metropolitan North Georgia Water Planning District, *Water Metrics Report* (February 2011).
[2] Fieldale Farms Corp. and Pilgrim's Pride Corp of Delaware.
[3] Total for major public and industrial users only, does not include private residential, commercial and irrigation uses.
[4] Source: EPD file review of each permittee's monthly reporting records (October 2013)

A summary of all the water use in Hall County, including groundwater and surface water, is included in **Figure 1.9**.

Figure 1.9 Hall County Water Use (2000-2012)



Sources:
GPUD Water production data - Gainesville Department of Public Utilities
Flowery Branch, Lula, and Industrial groundwater use - Metropolitan North Georgia Water Planning District, *Water Metrics Report* (February 2011) and EPD file review of each permittee's monthly reporting records (October 2013)
Self-supply – estimated at 2.4 mgd

1.4.6 Current Water Conservation Programs

GPUD is responsible for implementing water conservation measures in its service area. As its service area continues to expand to serve future customers in Hall County, GPUD's system management and conservation programs will be implemented across the GPUD service area. GPUD has had an active water conservation program for over a decade. The City of Gainesville adopted its initial Water Conservation Plan on March 1, 2000, and submits progress reports in accordance with this plan to the Georgia EPD every 5 years. In addition, the city also publishes an annual report that details water production and customer account information, as well as results of its system management and maintenance programs. The conservation program includes components which are described in detail in the Supply, Demand, and Conservation Technical Memorandum included as **Appendix D**.

Water Use and Conservation Assumption for this DEIS

Because Gainesville is the largest water provider for Hall County, the water use assessment focuses on data provided by Gainesville. Given that these data are the best available, trends identified by the data are used to extrapolate water use across the county. In addition, the Gainesville Public Utility Department (GPUD) is responsible for implementing water conservation measures in its service area. As its service area continues to expand to serve future customers in Hall County, GPUD's system management and conservation programs will be implemented across the Hall County service area.

Some of the major programs implemented by Gainesville to improve production efficiency include the following:

- Treatment plant efficiency management to reduce in-plant water use (for filter backwashing, basin washing, and chemical mixing, etc.)
- Leak detection surveys and a repair program that has covered over 75% of the service area since 2010 and saved an estimated quantity of 58 million gallons,
- System wide meter replacement and read technology project (completed in 2014) that included replacement of all system water meters with smart meters to improve meter accuracy.

For demand management, Gainesville has implemented the following to encourage conservation and currently complies with the Metro Water District's conservation requirements:

- A three-tier conservation rate structure, in place since 2008 and updated annually
- Plumbing codes requiring low flow fixtures in new construction
- Plumbing fixture rebates to encourage low flow fixture retrofits
- System-wide water audits beginning in 2012
- Employment of dedicated conservation/education outreach staff
- Active public education and outreach programs

As a result of the city's conservation efforts, it is one of eighteen communities in Georgia to receive the "Water First Community" designation recently and has repeatedly received awards for its public education and conservation programs. Additional information and documentation for the city's education and conservation efforts are included in **Appendix D**.

1.5 The U.S. Army Corps of Engineers' Determined Purpose

The scope of analysis for this DEIS requires that the Corps considers and expresses the Proposed Project's underlying purpose and need from a public interest perspective while generally focusing on the Applicant's stated purpose and need. The Corps has determined the purpose for the Proposed Project from the Applicant's and public's perspective.

1.5.1 The U.S. Army Corps of Engineers' Basic Purpose and Water Dependency Determination

Based on Section 404(b)(1) Guidelines of the CWA (40 CFR 230.10(a)(3)), the Corps has determined that the basic project purpose is to provide reliable water supply for the residents and businesses of Hall County, Georgia.

Not all of the various practicable alternatives that might be considered to provide a reliable water supply would require access to, proximity to, or siting within any special aquatic site (*e.g.,* sanctuaries, refuges, wetlands, mud flats, and vegetated shallows, etc.), Therefore, the Proposed Project is not water dependent (40 CFR 230.10(a)(3). Consequently, it is presumed that practicable alternatives not involving special aquatic sites are available and are less damaging pursuant to 40 CFR 230.10(a)(3).

1.5.2 The U.S. Army Corps of Engineers' Overall Project Purpose

The overall purpose of this project is to provide a reliable source of public water supply capable of satisfying the projected unmet water demand in Hall County's Service Area during drought conditions for the projected population growth through the year 2060.

1.6 The Corps' Need Analysis

The scope of analysis for this DEIS requires that the Corps considers and expresses the Proposed Project's underlying purpose and need from a public interest perspective while considering an Applicant's statutory and fiduciary responsibility for providing reliable public water supplies. The Corps has reviewed information provided by the Applicant, as well as performed an independent analysis to determine the need for the Proposed Project.

Hall County stated in its "2060 Need Certification" (404 permit application) that its future water supply need was estimated based on the following factors:

- Hall County population projections issued by the Georgia Office of Planning and Budget (OPB)
- Lake Lanier water supply availability
- Per capita water usage projected by the Metropolitan North Georgia Water Planning District (Metro Water District) in its 2009 Water Conservation and Water Supply Plan (District Plan)

Given that the OPB population projections were revised in January 2013, after the 404 permit was submitted, and the Lake Lanier allocation quantity may change after the WCM Update EIS is complete, the per capita water usage information provided by the Applicant required additional investigation. The

Corps evaluated these conditions and assumptions in detail and documented its evaluation in several technical memoranda. This section summarizes the revisions/changes that formed the basis of the Corps' analysis of Hall County's water supply need.

1.6.1 Population Projections

In the initial 404 permit application (June 2011), the Applicant stated that the projected 2060 population for Hall County would be 833,333. This was based on a set of 2030 population projections published by the State of Georgia OPB in March 2010 and projected 2050 population prepared for Georgia's regional water planning process. Hall County extrapolated these projections to the year 2060.

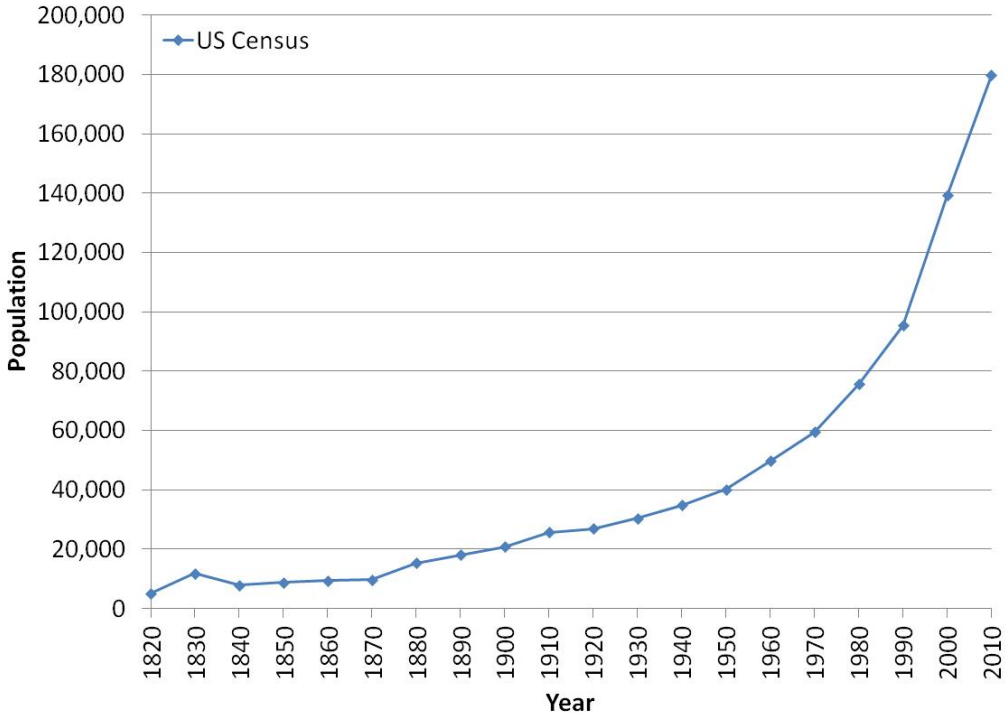
The Georgia OPB updates these population projections every two years for state budgeting and planning purposes. In January 2013, the OPB released updated population projections (referred to as the 2012 projections). Adjusted based on actual 2010 Census data and accounting for the effects of the economic downturn that began in December 2007, the revised projected 2030 population is approximately 25 percent (%) lower than its previous projection. On April 18, 2013, the Applicant provided revised population projections to the Corps in a letter from Randy Knighton, Hall County Administrator (**Appendix C**). Based on the memorandum accompanying this letter, the Applicant's revised population projections adopted Georgia OPB's published 2012 projections from 2010 through 2030 (2.2 - 2.4% annual growth), then extended the projections by assuming that the impacts of the economic downturn on the county would be mitigated after 2030, and that after this period, higher growth rate would return and mimic what was experienced from 2000 to 2007 (2.8% per year growth). The revised 2060 population projection for Hall County is 644,383 (**Appendix C**). **Table 1.4** and **Figure 1.10** shows the historical population and calculated annual compound growth rates for each 10-year period since 1820. **Table 1.5** summarizes the final Hall County population projections through 2060 and projected annual compound growth rates in 5-year intervals between 2010 and 2060.

Table 1.4 U.S. Census Historical Population for Hall County[1] (1820-2000)

Year	Historical Population	Annual Compound Growth Rate	Year	Historical Population	Annual Compound Growth Rate
1820	5,086	N/A	1920	26,822	0.4%
1830	11,748	8.7%	1930	30,313	1.2%
1840	7,875	-3.9%	1940	34,822	1.4%
1850	8,713	1.0%	1950	40,113	1.4%
1860	9,366	0.7%	1960	49,739	2.2%
1870	9,607	0.3%	1970	59,405	1.8%
1880	15,298	4.8%	1980	75,649	2.4%
1890	18,047	1.7%	1990	95,428	2.4%
1900	20,752	1.4%	2000	139,277	3.9%
1910	25,730	2.2%	2010	179,684	2.6%

Source: (U.S. Census 2010)

Figure 1.10 Historical Population for Hall County, GA



Source: (U.S. Census 2010)

Table 1.5 Revised Hall County Population Projections

Year	Population	Annual Growth Rate
2010	179,684	0
2015	201,310	2.3%
2020	226,172	2.4%
2025	252,433	2.2%
2030	282,164	2.3%
2035	323,799	2.8%
2040	371,577	2.8%
2045	426,405	2.8%
2050	489,324	2.8%
2055	561,526	2.8%
2060	644,383	2.8%

Sources:
Census: 2010; Georgia OPB, 2015 to 2030; Hall County: 2035 to 2060
Population Projections Technical Memorandum (May 2013), included as **Appendix C**

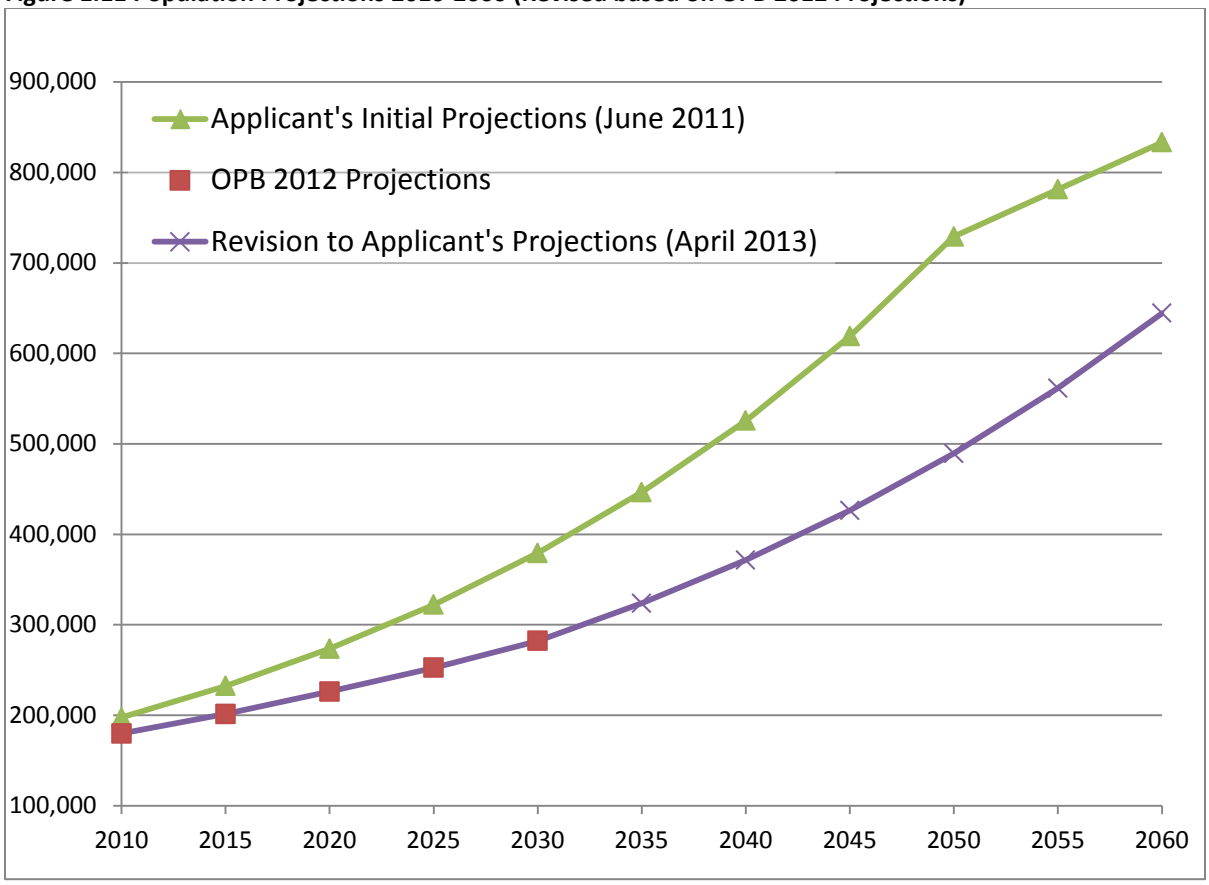
EPD reviewed and approved the revised projections, stating that the revised projections are consistent with OPB's 2012 projections (see EPD letter dated April 9, 2013, in **Appendix C**).

The Corps performed an independent review of the population projections, which is documented in the Population Projections Technical Memorandum (May 2013), included as **Appendix C**. This technical memorandum reviewed the Applicant's stated population and growth rates (both natural increase through birth and deaths and migration), in addition to other published data sources. The Corps determined the methodology used for population projections by the Applicant to be a reasonable approach and that it is appropriate for use in this DEIS based on the following rationale:

- Hall County is a local government with authorities and responsibilities to provide services to future residents, and Hall County wishes to plan for infrastructure that will support a full economic recovery by 2030, with pre-2007 growth rate for 2030-2060.
- Based on the rationale stated above, the resulting annual compound growth rate of 2.79% for 2030-2060 used by Hall County is reasonable compared to major counties in the metro Atlanta area.

Figure 1.11 compares the Applicant's initial and revised population projections.

Figure 1.11 Population Projections 2010-2060 (Revised based on OPB 2012 Projections)



Sources:
Georgia OPB 2012 Population Projections; Hall County 404 permit application (June 2011); and Hall County letter and memo for Revised Population Projections, April 18, 2013.

1.6.2 Availability and Reliability of Lake Lanier Water Supply Storage

As discussed in Section 1.1.1 (Project Background), the Corps Mobile District has resumed its update of the WCM for the ACF Basin, and the associated NEPA analysis to address the Corps' plans for operation modifications of Buford Dam and Lake Lanier. The quantity allocated for water supply from Lake Lanier will not be available until the Corps Mobile District completes its EIS and WCM update process.

The Applicant assumed that in the most likely scenario, Gainesville/Hall County would be allowed to continue the current level of withdrawal (approximately 18 mgd on an annual average basis) from Lake Lanier in the foreseeable future through the planning horizon of 2060 (2060 Need Certification, 404 permit application). In the 404 permit application, the Applicant also described a most optimistic scenario where Gainesville/Hall County could possibly be allowed to withdraw up to 44 mgd on an annual average basis from Lake Lanier.

The developments described in Section 1.1.1 (Project Background) and the most recent legal action (October 1, 2013) filed by the State of Florida suggest that resolving Lake Lanier's water supply allocation will likely be a lengthy process with continuing controversy between Georgia and the downstream states of Alabama and Florida. Because of this, and because further withdrawals beyond the 18 mgd have not yet been accommodated and will require a new storage contract in the future, this DEIS will use the current withdrawal level (18 mgd) as a baseline to estimate Hall County's projected future water supply need. Gainesville can withdraw up to 18 mgd as their baseline allocation from Lake Lanier, per the relocation contract between Gainesville and the Corps (see text box to the right). This is considered a reasonable baseline supply that is available and reliable from Lake Lanier for this DEIS.

Additional allocation scenarios and withdrawal quantities will be incorporated and discussed in Chapter 2 - Alternative Analysis.

Relocation Contract

The City of Gainesville was withdrawing up to 8 mgd from the Chattahoochee River before the construction of Buford Dam. As compensation for property taken for construction of Buford Dam and Lake Lanier, the city relocated their water intake and was allowed to withdraw up to 8 mgd directly from Lake Lanier, under a 1953 relocation agreement with the Corps. The Corps has authority to enter into new agreements to reallocate storage space at Lake Lanier to meet existing and future water supply needs of Gainesville, and other water authorities in the Atlanta region, under the Water Supply Act of 1958; but such agreements have not yet been negotiated. The current 18 mgd maximum that Gainesville is allowed to withdraw from Lake Lanier is based on the original 1953 relocation agreement. This agreement has been interpreted by the Corps to allow Gainesville to withdraw up to 18 mgd, provided it returns at least 10 mgd to Lanier in treated effluent.

1.6.3 Demand Forecasts

The Corps reviewed supply and demand projections in the Supply, Demand, and Conservation Technical Memorandum, included as **Appendix D**. This section reviews demand forecasts performed by the Applicant and the Corps.

1.6.3.1 Applicant's Demand Forecasts

The Applicant's proposed need was estimated based on a future per capita water usage of 120 gpcd; which results in 77.3 mgd in projected 2060 water needs (Hall County letter and memo for Revised Population Projections, April 18, 2013, **Appendix C**).

1.6.3.2 The Corps' Assessment

Hall County has stated that they intend to implement additional water conservation measures to reduce system-wide per capita usage to 120 gpcd by 2060. However, other than citing the 2009 District Plan, the 404 permit application did not include documentation or calculations supporting how this could be achieved. The 2009 District Plan was prepared for the planning horizon of 2035 and did not include per capita water use data to support the Applicant's assumption for the planning period beyond 2035. In

addition, as Gainesville operates and maintains the water system, Hall County cannot "implement" additional water conservation programs without agreement and cooperation from Gainesville.

Because of this complexity, the Corps' EIS team determined that additional evaluation is needed for this DEIS, so that:

- Water conservation measures, as applicable, can be quantified systematically
- Effects of population projections and employment trends can be correlated
- Existing conservation and water system management, including Gainesville's water loss reduction program can be estimated for the 2060 planning horizon

This DEIS includes a detailed demand forecast modeling effort to evaluate potential savings based on water conservation measures.

1.6.4 Factors and Demand Forecast Model used for Hall County's Future Demand Forecasts

Hall County's existing water use patterns were analyzed based on water production and consumption data provided by the City of Gainesville. For the purpose of this DEIS, City of Gainesville water system data was assumed representative of Hall County as a whole. Analysis factors include:

- 2007 – 2012 water system production data
- 2007 – 2013 annual billing totals for each customer category
- Non-revenue water (total system water loss)
- Conservation programs required by the Metro District, Federal Plumbing Code, and Georgia Plumbing Code
- City of Gainesville water system goals for water loss reduction

The Corps also used the "Demand Side Management Least Cost Planning Decision Support System" computer model (DSS Model) to forecast water demands and assess future water conservation measures for 2060. The DSS Model, developed by Maddaus Water Management, was previously used for the development of the Metro Water District's Water Supply and Water Conservation Plans (2003 and 2009). The DSS Model assessed water conservation measures that are expected to be implemented by 2060, including those required by the Metro Water District and the Georgia Water Stewardship Act (2010).

In the 2009 District Plan, the year 2006 water production and billing data were used to create baseline data for the plan projections. The model for Hall County from the 2009 District Plan was obtained and updated with recent data, including 2007-2012 water production and billing data, the 2010 Census, and updated population projections. It was determined that the DSS Model can provide estimates for water savings using methodologies accepted by the Metro District and the Georgia EPD to assess the impact on water savings. Demand projections incorporating existing conservation requirements can be used for the Corps' baseline project need, and projections incorporating potential future conservation measures can be considered as part of the Alternative Analysis.

Details of the DSS Model analysis and the conservation measures incorporated into the model are discussed in the Supply, Demand, and Conservation Technical Memorandum, included as **Appendix D**.

In addition, the technical memorandum also includes a summary of Gainesville's conservation program implementation status, comparing it to various state-wide, district-wide, or regional programs, including:

- Metro Water District's current conservation requirements (adopted in 2009 and amended in 2010)
- The Water Stewardship Act (Senate Bill 370) enacted in 2010
- A detailed comparison with EPA's Water Efficiency Evaluation Checklist as listed in EPA Region 4 "*Guidelines on Water Efficiency Measures for Water Supply Projects in the Southeast*"

1.6.5 The Corps' Demand Projection Scenarios

Three scenarios were developed based on extensive review and analysis of existing data and interviews with Gainesville's staff regarding implementation of existing water conservation programs. The scenarios were modeled as described below:

- **Scenario 1, Baseline Water Demand,** is based on water system data provided by GPUD (2007 – 2012) and incorporates existing conservation levels that could be achieved through continued implementation of the International Plumbing Code of 2006 (State of Georgia's minimum requirements). This scenario assumes that the existing non-revenue water (NRW) of 15.9% of total withdrawal will be maintained through 2060.
- **Scenario 2**, **Water Demand with State and Regional Conservation Measures,** includes additional conservation levels that could be achieved through continued implementation of the International Plumbing Code of 2006, the Metropolitan North Georgia Water Planning District conservation requirements, and the Georgia Water Stewardship Act requirements. This scenario assumes that the existing NRW (expressed as % total withdrawal) will be reduced to 12.95% of total withdrawal by 2025 (equivalent of 0.20% reduction of NRW per year, equivalent to the current implementation results) and continued implementation of maintenance programs (leak reduction/repair and meter replacement) to maintain a steady NRW at 12.95% through 2060.
- **Scenario 3, Water Demand with Additional NRW Reduction** uses the baseline water demand and estimates additional conservation levels that could be achieved through continued implementation of the International Plumbing Code of 2006, the Metropolitan North Georgia Water Planning District conservation requirements, and the Georgia Water Stewardship Act requirements. Additionally, this scenario assumes that the existing NRW will be reduced to 12.09% of total withdrawal by 2025 (equivalent of 0.25% NRW reduction per year through 2025) and continued implementation of maintenance programs (leak reduction/repair and meter replacement) to maintain a steady NRW at 12.09% through 2060.

Table 1.6 presents a summary of the water conservation measures modeled in the three scenarios. As NRW is a key parameter in estimating water loss reduction effort (thus water savings), the NRW assumptions for each scenario are summarized in **Table 1.7.**

The projected water demand is shown in **Figure 1.12** and the projected total system per capita water demand is shown in **Figure 1.13**.

Table 1.6 Summary of Water Conservation Measures Modeled

Conservation Measure	Scenario 1	Scenario 2	Scenario 3
Establish conservation rates		X	X
Rain-sensor shut-off device on irrigation controllers		X	X
Multifamily sub-metering requirement		X	X
Water loss reduction (NRW reduction)		X	X
Residential water surveys/audits		X	X
Low flow showerhead & aerator distribution		X	X
Commercial water audits		X	X
Water conservation public education program		X	X
High Efficiency Toilet (HET) rebates (single family and multifamily)		X	X
Installation of HETs and high efficiency urinals in government buildings		X	X
Irrigation meters pricing		X	X
Require car washes to recycle water		X	X
Meter replacement – point of use leak detection		X	X
Meter private fire lines		X	X
Water waste policy adoption		X	X
Implementation of high efficiency plumbing	X	X	X

Table 1.7 Targeted Non-Revenue Water for Demand Modeling Scenarios

Scenario	NRW as % of Total Withdrawal 2010	2025	2060	Assumptions
1	15.9%	15.9%	15.9%	Continued implementation of plumbing fixtures meeting International Plumbing Code Maintaining constant NRW (15.9%) through 2060
2	15.9%	12.95%	12.95%	High efficiency plumbing fixtures State and regional conservation measures 0.19% reduction in NRW per year through 2025, maintain constant NRW 2025 through 2060
3	15.9%	12.09%	12.09%	High efficiency plumbing fixtures State and regional conservation measures 0.25% reduction in NRW per year through 2025, maintaining constant NRW 2025 through 2060

Figure 1.12 Projected Water Demand with Conservation Savings Projections

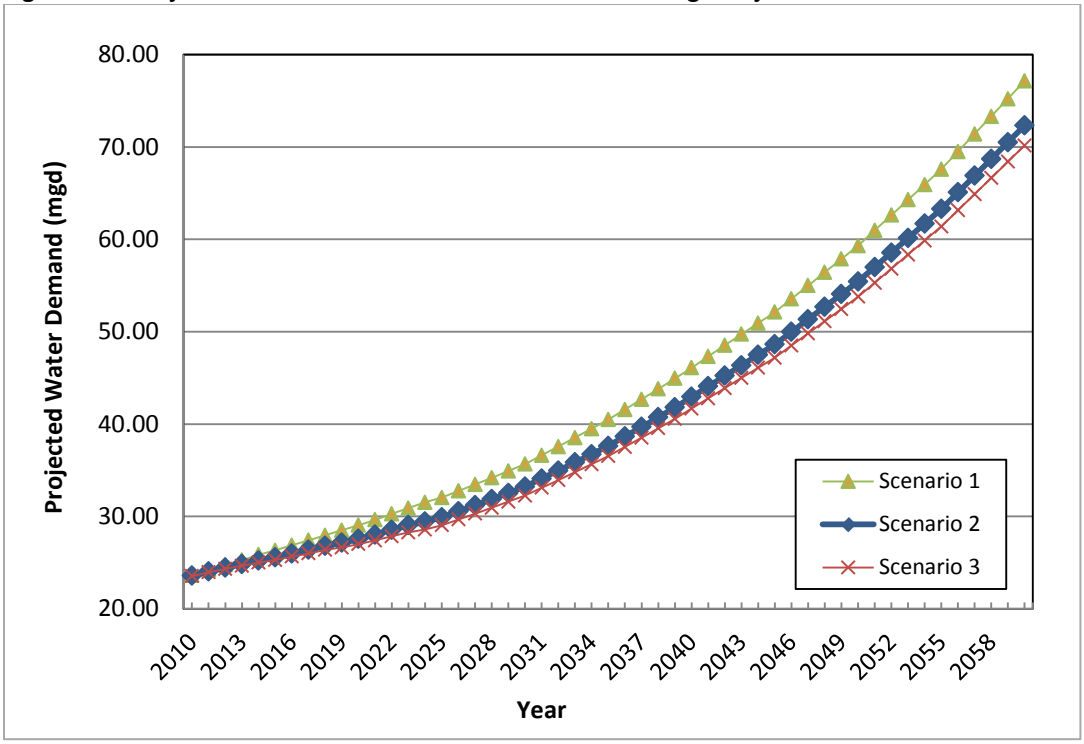
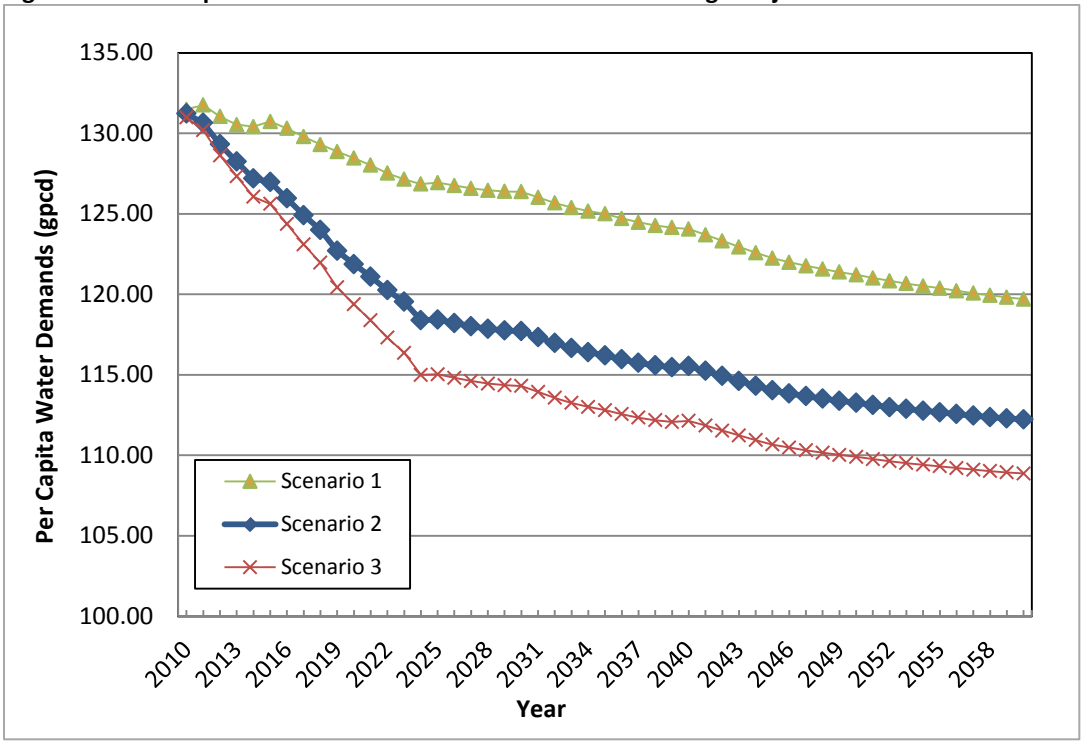


Figure 1.13 Per Capita Water Demands with Conservation Savings Projections



Based on this analysis, Hall County's projected 2060 demand of 77.1 mgd is closest to Scenario 1, with continued implementation of the International Plumbing Code (state requirement). However, the

Applicant's projected 2060 demand of 77.3 mgd does not adequately incorporate savings that could be realized through the implementation of regional (Metro Water District) water conservation requirements. This need equates to a per capita water demand of approximately 120 gpcd, using the projected 2060 population of 644,383.

Scenario 2 reflects the current regional and state conservation and plumbing code requirements based on the existing level of NRW reduction effort derived from Gainesville's leak detection and repair programs for the 3-year period of 2010 to 2012. Based on this analysis, Scenario 2 is determined by the Corps to be representative of the continued implementation of existing conservation measures and should be used to form the baseline total system need for Hall County (72.5 mgd in 2060). This need equates to a per capita water demand of approximately 113 gpcd, using the projected 2060 population of 644,383.

In summary, Scenario 1 is used as the Applicant's stated need and Scenario 2 is selected to establish the Corps' determined need for this DEIS. Scenario 3 will be used in the Alternatives Analysis to consider the water use reduction associated with implementing additional water conservation measures as a potential component of DEIS alternatives.

1.6.6 The Corps' Determination of Need

1.6.6.1 Factors affecting the Corps' Determination of Need

In estimating the need for the proposed water supply project, several existing water supply sources such as Lake Lanier, Cedar Creek Reservoir, and groundwater supplies will be considered the "basic or common components" in each of the "alternatives" to be developed in Chapter 2. For the "Alternatives Analysis" process, this DEIS defines "additional water supply need of Hall County (or unmet need)" as the difference between the projected total 2060 demand and the baseline available quantity from Lake Lanier, Cedar Creek Reservoir, and groundwater supply sources. The following provides a summary of the need analysis.

Lake Lanier

As discussed in Section 1.6.2., this DEIS will use the current withdrawal quantity of 18 mgd from Lake Lanier as the "baseline" withdrawal quantity to estimate the additional water supply need. Withdrawals exceeding 18 mgd will be considered in Chapter 2: Alternatives Analysis.

Cedar Creek Reservoir

The Applicant uses the safe yield of 7.5 mgd listed in the EPD-issued withdrawal permit for the Cedar Creek Reservoir to estimate its unmet water supply need. The withdrawal permits were issued in 2002 and the reservoir yield was estimated based on limited streamflow data (for the period of 1951-1961) at the time. It included the drought that occurred in the late 1950s, but did not include a historical drought period as critical as the 2008-2009 drought. For this DEIS, the Corps uses a consistent period of records that include the 2008 -2009 critical drought to evaluate water supply reliability for all sources. An updated yield analysis was performed using updated simulated streamflow data and the revised reliable

annual average daily yield is 4.3 mgd based on the 2008-2009 critical drought period. Details of streamflow comparison and yield analysis can be found in the Cedar Creek Reservoir Yield Analysis Technical Memorandum, included in **Appendix E**. The Georgia EPD has performed its independent analysis on yield for Cedar Creek Reservoir and concurred with the revised yield. However, it does not plan to adjust the permit unless a structural change is proposed for the reservoir.

Groundwater Availability

Hall County's Application stated that "the wells are capable of supplying up to 3.5 mgd; however, groundwater wells in the Crystalline aquifer are not typically a reliable source of water during drought conditions. Of the 3.5 mgd current groundwater use, about 0.60 mgd is for eleven EPD permitted drinking water systems. New wells have been permitted recently with estimated yields in the 0.8 to 1.0 mgd in Georgia. It is anticipated that some private groundwater well use in Hall County will discontinue as public water supplies become available. A review of groundwater availability based on best available data concluded that 4.75 mgd of groundwater could be available in Hall County. Details of groundwater availability analysis can be found in the Groundwater Availability Technical Memorandum included in **Appendix F**.

1.6.6.2 Applicant's Stated Need

Based on the Applicant's revised 2060 demand of 77.3 mgd, the Applicant anticipates the unmet need for Hall County to be 49.8 mgd by 2060. This water will need to be provided through sources in addition to Hall County's current sources.

1.6.6.3 The Corps' Determined Need

Based on the Corps' projected 2060 demand, the Corps anticipates the unmet need for Hall County to be approximately 45.5 mgd by 2060. This water will need to be provided through additional sources, and is used as the Applicant's justification for their 404 Permit Application.

Table 1.8 provide a comparison of existing (and potential) water supply sources and 2060 water demand projections prepared by Hall County and by the Corps (all values shown are based on annual average daily basis). **Figure 1.14** shows the Applicant's projected water demand vs. existing supplies. The figure shows that Hall County may need additional water supply sources by 2020. Some of the additional water supply sources may include additional water conservation, purchasing from other counties, and/or construction of a water supply reservoir. **Figure 1.15** shows the Corps' projected water demand vs. existing supplies.

Table 1.8 2060 Water Demand Projections (all values shown are based on annual average daily basis)

Possible Water Sources in 2060	Applicant (mgd)	Corps (mgd)
Projected Demand		
2060 Projected Water Demand	77.3	72.5
Existing Supplies (assumed)		
Lake Lanier	18.0[1]	18.0[1]
Cedar Creek Reservoir	7.5[2]	4.3[3]
Groundwater (existing and future)	2.0[4]	4.7[5]
Total Available Supply	27.5	27.0
Unmet Demand		
Additional Water Supply Need in 2060	49.8	45.5

Notes:
1. Existing withdrawal quantity from Lake Lanier allowable without a storage contract
2. Approved yield as listed in the withdrawal permit
3. Revised yield based on updated streamflow data including the 2008-2009 drought; EPD reviewed and concurred with the revised yield
4. Estimated future demand by the Applicant, 404 permit application (2011)
5. Estimated total availability, Corps

Figure 1.14 Applicant's Projected Annual Average Daily Water Demand vs. Existing and Potential Future Supplies

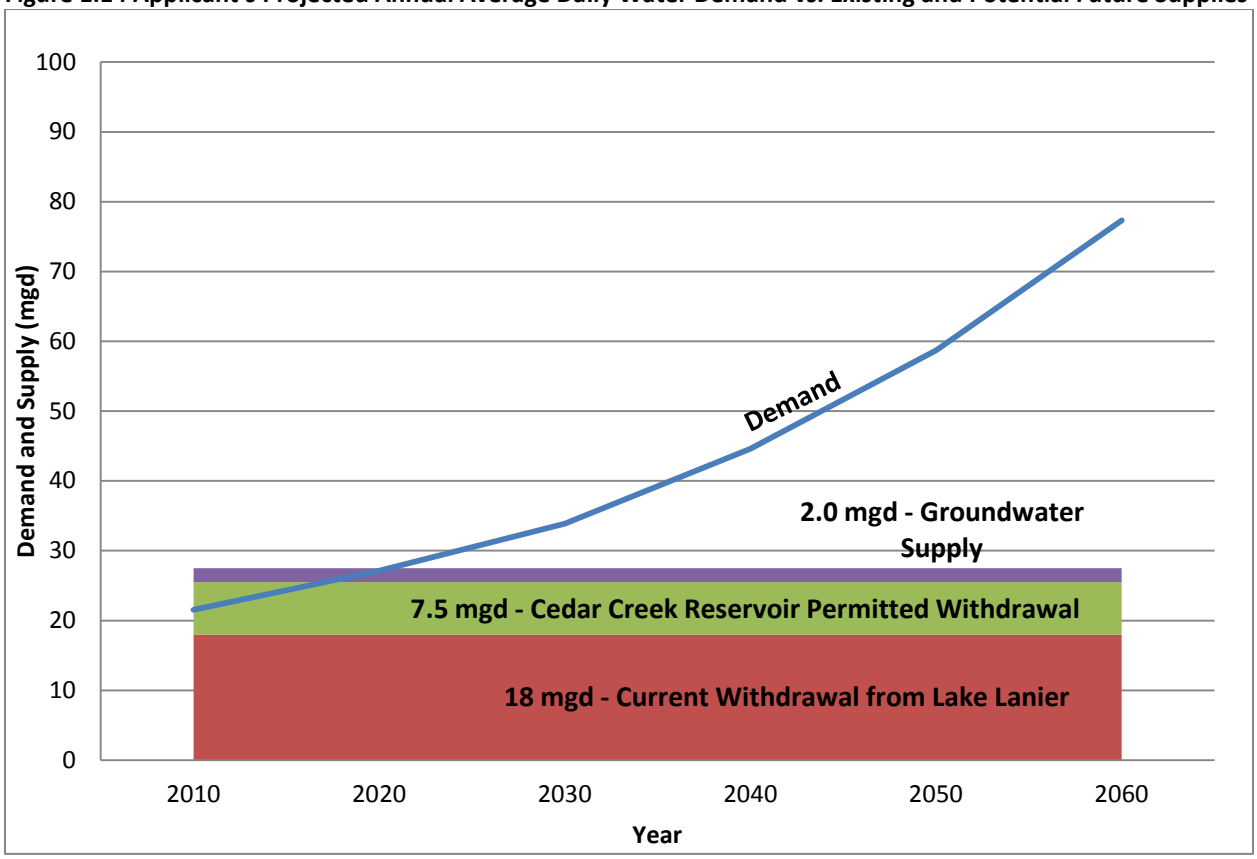
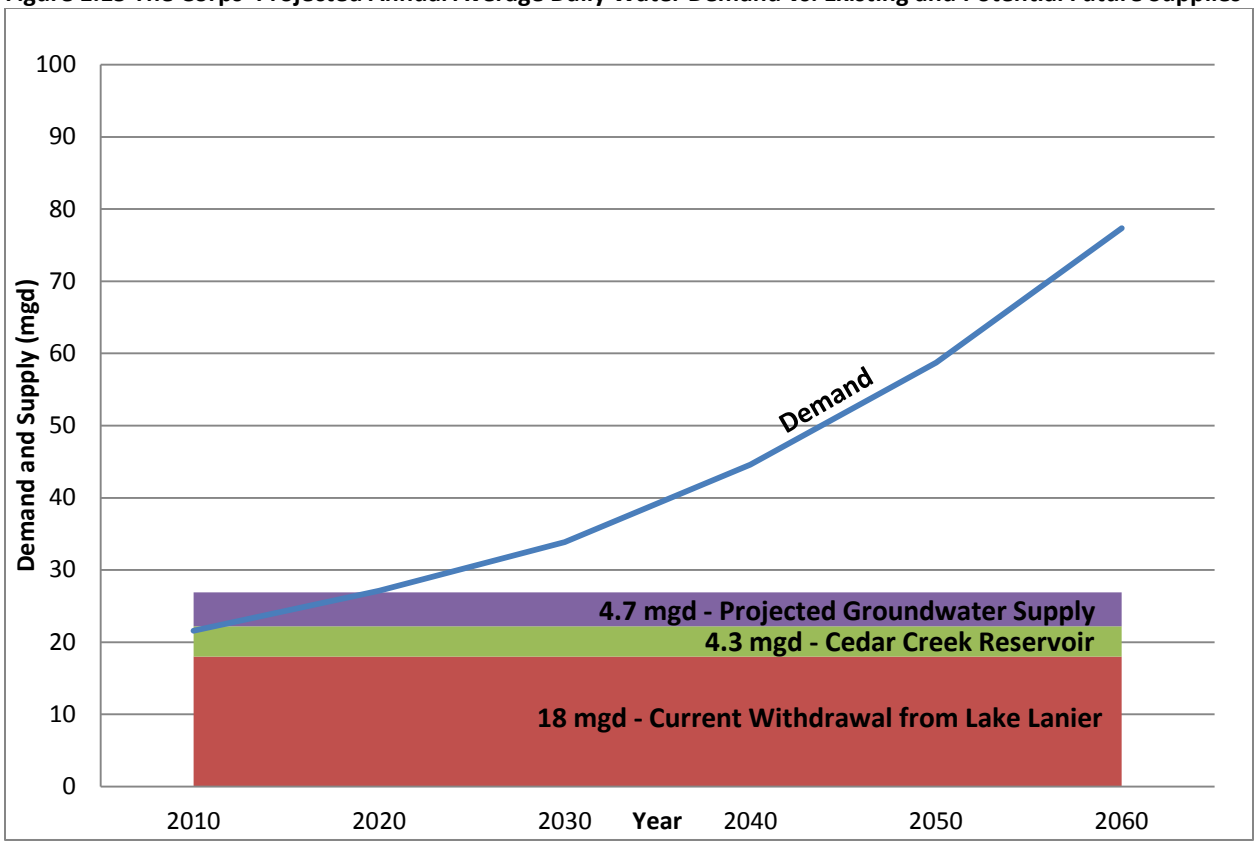


Figure 1.15 The Corps' Projected Annual Average Daily Water Demand vs. Existing and Potential Future Supplies



1.7 Administrative and Environmental Requirements (Other Permits and Approvals)

Construction and operation of most of the proposed alternatives considered for this draft EIS, including the Proposed Project outlined in Section 1.1.2, would require a Section 404 permit from the Corps. As required by Section 404(b)(1) guidelines, the Corps must conduct an impartial evaluation of the practicable alternatives to the proposed Glades Reservoir project.

The Corps must wait a minimum of 30 days after issuing the Final EIS before issuing the Record of Decision (ROD). The Corps may issue, issue with modification(s), or deny the permit. The Corps may also add special conditions to the permit to satisfy legal or public interest requirements, as long as they are directly related to the impacts of the proposal, appropriate to the scope and degree, and reasonably enforceable (33 CFR 325.4(a)).

In addition to the Section 404 permit, other federal, state, and local permits and approvals would be necessary for the proposed Glades Reservoir project to be constructed. **Table 1.9** provides a general list of the permits, approvals, and consultations that may be required for the Proposed Project.

Table 1.9 Potential Permits and Approvals for the Glades Reservoir Project

Agency		
U.S. Army Corps of Engineers	CWA Section 404 and Rivers and Harbors Act Section 10 Permit	Required for regulated impacts to wetlands and waterbodies, e.g., site development, pipeline and road construction, water/wastewater discharge, etc.
U.S. Environmental Protection Agency (EPA)	Clean Air Act (CAA) Title V Permit, Preconstruction Permit, and General Conformity Determination	Estimated potential to emit (PTE) in excess of Prevention of Significant Deterioration (PSD) or Hazardous Air Pollutants (HAPs) thresholds.
Federal Emergency Management Agency (FEMA)	Conditional Letter of Map Revision (CLOMR) or Letter of Map Revision (LOMR)	Construction or planned construction in the floodplain
Georgia Department of Natural Resources (GDNR) Environmental Protection Division (EPD)	Stream Buffer Variance	Development within 25' of waters of the state (50' for coldwater/trout streams)
	CWA National Pollutant Discharge Elimination System (NPDES) Permit	Construction activity that disturbs 1 acre or more and discharges stormwater to waters of the state or into a municipal separate storm sewer system
	Erosion, Sedimentation, and Pollution Control Plan (ESPCP)	
	CWA Section 401 Water Quality Certification (WQC)	Required for CWA Section 404 Permit
	Safe Dams Permit	
	Water Withdrawal Permit	
GDNR Wildlife Resources Division	Threatened and Endangered Species Consultation	Threatened and endangered species survey required. Consultation required if protected species or suitable habitat identified.
Georgia Department of Transportation	Overweight Load Permit	Oversized/overweight loads during construction
	Right of Way/Driveway Permit	Site Access
Hall County Office of Planning and Zoning	Change of Zoning, Building Permit	

1.7.1 U.S. Army Corps of Engineers

The Corps is the lead federal agency for the Glades Reservoir DEIS. The Corps is responsible for the content of the draft EIS and is required to ensure that this document complies with the standards of the National Environmental Policy Act (NEPA). The Corps will evaluate the foreseeable impacts for the Proposed Project and for reasonable alternatives.

1.7.2 Georgia Environmental Protection Division

The EPD is a cooperating agency for the preparation of this DEIS. The EPD is responsible for protecting and restoring Georgia's environment to meet the needs of current and future generations. The EPD is in charge of issuing various permits that would be required prior to the construction of the proposed reservoir or any reservoir alternative, notably the Section 401 Water Quality Certification and the Water Withdrawal Permit.

1.7.3 U.S. Environmental Protection Agency

The EPA is a cooperating agency for the preparation of this draft EIS. The EPA had an advisory role in development of the DEIS and advised the Corps in areas of their technical and regulatory expertise.

It should be noted that EPA's status as a cooperating agency has no effect on their authorities under Section 102(2)(C) of the National Environmental Policy Act 5 (NEPA), Section 309 of the Clean Air Act, or the Clean Water Act (CWA). Similarly, EPA's role as a cooperating agency does not imply that EPA necessarily concurs with all aspects of the EIS and the selection of the Proposed Project.

1.7.4 Metropolitan North Georgia Water Planning District

The Metro Water District is a regional planning association that was created to establish policy, create plans, and promote intergovernmental coordination of water issues in the district from a regional perspective. The Metro Water District works with local governments, water and wastewater utilities, and stakeholders to develop regional and watershed-specific plans for stormwater management, wastewater treatment, and water supply and conservation. Hall County is a member of the 15-county Metropolitan North Georgia Water Planning District, and in order to receive certain permits, a jurisdiction must be in compliance with the Metro Water District's water resources management plans. These plans set regional guidelines for water supply, conservation, wastewater, and stormwater. The most recent Water Supply and Water Conservation Management Plan (to year 2035) was adopted by the Metro Water District in May 2009. The Metro Water District is currently updating its water resources management plans and is scheduled to complete and adopt updated plans in November 2016.

1.8 DEIS Preparation

To develop this draft EIS, a comprehensive literature search of studies related to the proposed Glades Reservoir project, including documents prepared by Hall County, was conducted. This draft EIS was developed based on best available data.

The Corps independently reviewed information provided by Hall County to confirm accuracy, and to understand and confirm key statements and conclusions. The technical review focuses on the reasonableness of the data sources, analytic methodology, and results.

The Corps solicited public comments on the proposed Glades Reservoir project during a series of public scoping meetings held in March 2012. The Corps also met with agency representatives from the states of Georgia, Alabama, and Florida during this time to discuss the EIS process and the Proposed Project. The 60-day scoping period for the Glades Reservoir project occurred from February 17 to April 17, 2012, during which the Corps received 592 individual comments.

The scoping comments have been considered for the preparation of this DEIS. The scoping comments were analyzed and sorted into the following categories:

- Air Quality
- Alternatives
- Aquatic Ecology, Wildlife and Wetlands
- Cultural Resources
- Cumulative Effects
- Federal Navigation
- Geology and Soils
- Land Use and Aesthetics
- Mitigation and Monitoring
- Project Purpose and Need
- Public Involvement and NEPA Process
- Recreation
- Socioeconomics and Environmental Justice
- Threatened and Endangered Species
- Water Quality
- Water Quantity and Hydrology

1.9 DEIS Organization

This DEIS complies with the Council on Environmental Quality (CEQ) EIS requirements (40 CFR 1502.10) and the Corps requirements (33 CFR 325, Appendix B). This DEIS is organized in the following way:

- ***Chapter 1: Purpose and Need***—describes the purpose of and need for the action, the Corps' role in the EIS process, and the required regulatory actions for the Proposed Project.
- ***Chapter 2: Alternatives Analysis***—includes the proposed action and all reasonable alternatives. Describes the alternatives screening process and lists the DEIS alternatives that were evaluated in-depth for this document.
- ***Chapter 3***: ***Affected Environment*** —discusses existing conditions and the affected environment.
- ***Chapter 4***: ***Environmental Consequences***—evaluates the potential effects of each alternative, including the Proposed Project, for the issues identified during the scoping process.
- ***Chapter 5***: ***Public Involvement and Agency Coordination***— summarizes public involvement and agency coordination performed for the project.